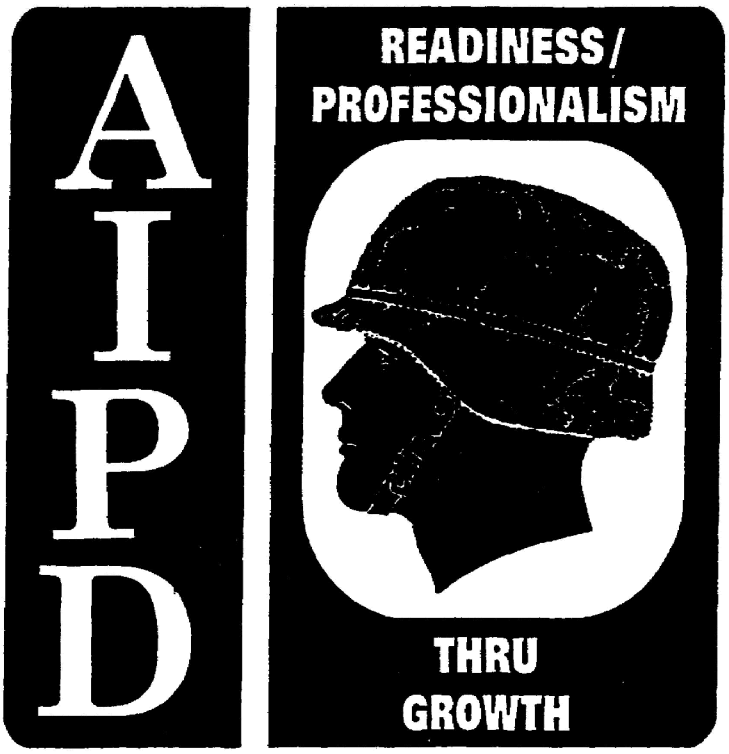
SUBCOURSE QM0333

EDITION 8

BASIC FOOD PREPARATION



THE ARMY INSTITUTE FOR PROFESSIONAL DEVELOPMENT

ARMY CORRESPONDENCE COURSE PROGRAM

QM 333

BASIC FOOD PREPARATION

EDITION 8
13 CREDIT HOURS

SECTION I

INTRODUCTION

1. SCOPE. This subcourse covers the control of quality in basic food preparation; the food preparation of various food items with methods of controlling the quality and guidelines for Judging the quality of the finished products; identification of foods that can be served as leftovers and suggestions for serving leftovers as palatable food items.

2. APPLICABILITY. This subcourse is of special interest to all Army personnel who are involved with or anticipate involvement with any aspects of basic food preparation. It is of particular interest to food service sergeants, food service supervisors, and food advisers. Successfully completed, this subcourse will give the student a working knowledge of the responsibilities, techniques, and procedures in a food service operation. This knowledge will enable you, with additional formal or on-the-Job training to operate effectively as a food service sergeant.

3. PROGRAM OF CONTINUING STUDY. When you successfully complete this subcourse, we recommend that you apply to take one or more of the following:

a. QM0330, Management of Field Kitchen Operations.

b. QM0454, Food Preparation, Part 1.

c. QM0455, Food Preparation, Part 2.

SECTION II

ADMINISTRATIVE INSTRUCTIONS

4. RECEIPT OF MATERIALS.

a. Check your subcourse materials. Each subcourse packet that you receive will consist of one or more of the following: a subcourse booklet, reference text(s), lesson solution(s), an examination, an examination response sheet, and a self-addressed, franked envelope for returning your examination response sheet. To determine the reference materials needed to complete your subcourse requirement, read the introduction in the subcourse booklet. It lists the number of lessons, reference text(s), and other items which are issued with the subcourse packet. Please notify us immediately of any shortages.

b. Do not return any course materials. Do not return any of the items, i.e., subcourse booklet, Field Manual, Army Regulation, Special Text, commercial text, etc., sent to you.

5. SUBCOURSE ORGANIZATION. This subcourse is organized into this single booklet containing materials needed to complete the subcourse. If additional materials are needed, they are indicated on the booklet cover. This subcourse booklet consists of lessons and an examination. Each lesson consists of a lesson assignment, contents pages, lesson text, and self-grading lesson exercises.

6. LESSON TESTS. Each lesson in this subcourse is designed for self-evaluation. This is done through the self-grading exercises which you must work after studying each lesson text. You will find instructions for completing the exercises in each lesson. Because you complete the lesson tests and verify your own work, you do not submit your answers for grading. This is what is meant by the self-evaluation characteristic of this subcourse's lessons. You will receive credit for the total hours of this subcourse upon successful completion of the examination.

7. TESTS AND EXAMINATIONS. Each subcourse has an examination booklet bound together with the subcourse booklet. ONLY THE EXAMINATION RESPONSE SHEET IS SUBMITTED FOR GRADING. To indicate your examination responses, circle your answer to each question in the examination booklet and retain this until you have received your results.

8. PREPARING YOUR EXAMINATION RESPONSE SHEET.

a. Description of the response sheet. The US Army Training Support Center uses a standard examination response sheet. This sheet has mark-sense blocks and can only be used for multiple choice testing.

b. Check your response sheet. Make sure you have the correct examination response sheet. Verify your social security number (SSN), the subcourse number and edition number. These should be the same on both the study materials and the examination response sheet. If any of these numbers are incorrect, call your counselor for issuance of a corrected response sheet, or return the response sheet, unmarked, with a letter to explanation. If you use a response sheet which has a different number from the subcourse you are working, your response will be graded against the wrong set of test items and you may receive a failing score.

c. Steps in preparing and submitting your examination response sheet. Carefully follow the specific instructions printed in the INSTRUCTIONS block of your response sheet. Be sure you have marked one, and only one, response for each test item. For a TRUE-FALSE test item, mark A for true and B for false. Fold the response sheet just as it was folded when sent to you, place it in the self-addressed, franked envelope provided, and mail it to this center.

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LESSON 1 **Credit Hours: 2**

LESSON ASSIGNMENT

SUBJECT	Control of Quality in Basic Food Preparation
STUDY ASSIGNMENT	Lesson Text
SCOPE	Control of quality in preparation of food: Food palatability factors, control practices and methods for assuring quality in preparation of foods, and quality control of food in storage.
OBJECTIVES	As a result of this assignment, you will be able to--

1. State the objectives of food preparation.
2. List the factors contributing to the palatability of foods and recognize pertinent characteristics of each.
3. State the Importance of using the standard recipes published in TM 10-412 as a means of controlling quality.
4. Convert a recipe for serving 100 people to a recipe for serving a given number of people.
5. List the accepted practices for weighing and measuring ingredients and recognize the measuring procedures prescribed by TM 10-412.
6. Describe the methods of mixing and indicate the steps to be taken to insure a good quality in the finished product.
7. Match the control practices of cooking with the method of cooking.
8. Describe the effect of oxidation on the quality of the food product.
9. Define and describe progressive cookery.
10. List the effects of high heat on the quality of food items.

11. State and explain the effects of water on the quality of cooked foods and name the effects of hard and soft water on the cooked product.

12. Select the control practices that should be considered in the surveillance of food in storage at the dining facility.

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*** IMPORTANT NOTICE ***

THE PASSING SCORE FOR ALL ACCP MATERIAL IS NOW 70%.

PLEASE DISREGARD ALL REFERENCES TO THE 75% REQUIREMENTS.

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LESSON TEXT

SECTION I

INTRODUCTION

1. GENERAL. Food standards are difficult to define and are not measurable by mechanical means. However, it is possible to evaluate food products in terms of nutritive value, flavor, and appearance. In a dining facility, the acceptance of a food item by the persons consuming it is used as a "standard" more often than any other means of measurement. Even then several factors tend to influence individual opinion about the quality of food: age, cultural and socio-economic background, past experiences relating to foods, education and scientific knowledge, and emotions. Each person considers himself an expert, based on his own likes and dislikes. Also, maintenance of quality in quantity food preparation is difficult. There are several mechanical controls such as accuracy in weights and measures of ingredients, standard recipes, and standardized equipment and tools that are necessary to obtain quality products. Food service personnel must incorporate these control features at strategic points in the processing and serving of food to preserve the quality of the finished product.

2. OBJECTIVES OF FOOD PREPARATION. The objectives of good food preparation are to conserve the nutritive value of the food; to improve the digestibility; to develop and enhance flavor and attractiveness of original color, shape or form, and texture; and to free the food from injurious organisms and substances.

a. CONSERVATION OF NUTRITIVE VALUE. The nutritive value of any food depends upon its composition. If the preparation does not involve cooking or soaking, the original nutritive value may be regarded as largely conserved. When the preparation involves cooking, certain changes may occur, the most important of which are the destruction of some of the vitamin content and some loss of minerals. Specific changes in nutritive value are discussed with each food group included in this text.

b. IMPROVEMENT OF DIGESTIBILITY. When some foods are cooked, chemical changes take place that are identical with those of digestion. For example, starch is transformed into dextrin and sugars, and fats are partially split. In some cases, when food items are cooked at high temperature or with long-continued low heat, the consistency of the food item changes but digestibility of the product is not improved. The result may be a cooked item that is not easily digested.

c. ENHANCEMENT OF FLAVOR AND ATTRACTIVENESS. The effect of cookery on the palatability of food may be to enhance and to conserve the normal flavor, to develop a particular flavor, or to blend flavors. The volatile substances that produce flavor

in a food may be driven off or may be changed to other compounds far less enjoyable. The effects of cookery on color, form, and texture are also important factors in the palatability of food.

(1) FLAVOR. To conserve and enhance the original flavor of foods, the cooks must insure that the correct temperature for producing the desired results is used. The standard recipe gives the cooking instructions for each type of food.

(2) COLOR. The conservation of color, such as the green of beans and the red of beets, or the development of color, such as in the roasting of meats and the baking of cookies and cakes, is one goal of cookery.

(3) FORM. Foods may be prepared so that the original form or shape is maintained or so that some other form is produced. Baked apples, boiled potatoes, and broiled steaks are obvious examples of foods that show little marked change in form when properly prepared. French fried potatoes, sliced beets, diced carrots, and all pastries, batters, doughs, casseroles, and similar dishes are cooked foods in which the original foods or ingredients are changed. The slices or other forms should be uniform in size, thickness, and contour to present an appetizing finished product. Also, the slices or other shapes should be apparent as such, rather than as a mass.

(4) TEXTURE. Texture may be maintained in its natural state, softened as in some fruits and vegetables, or hardened as in pastries, batters, and doughs. Marked changes in texture are usually accompanied by changes in form. The food preparation should maintain or develop the texture that is regarded as desirable and characteristic of a given standard product. Salad ingredients that are too finely shredded or creamed dishes that are of pastry consistency present forms that do not enhance the attractiveness of the finished food items.

d. MAKING FOOD SAFE FOR HUMAN CONSUMPTION. Foods must be handled properly from purchase until consumption. The safety of food for human consumption often depends on destroying by cooking those microorganisms and parasites that cause infectious diseases and food poisoning and cause off-flavors, discoloration, and similar spoilages that may be unpleasant and distasteful but are not necessarily cause for human illness. Management practices for the safe preparation of each type of food are discussed later in this text.

3. PALATABILITY OF FOOD. One of the desired results of food preparation is palatability. Factors that contribute to palatability are shown in figure 1. Every food has a characteristic appearance, odor, taste, and feel which is associated with normality, and any deviation from this normality is not acceptable. Even changes in the color of foods may be an indication of change in their nutritive value. Palatability depends largely upon the freshness of foods. Methods of pre-preparation and cookery which enhance the

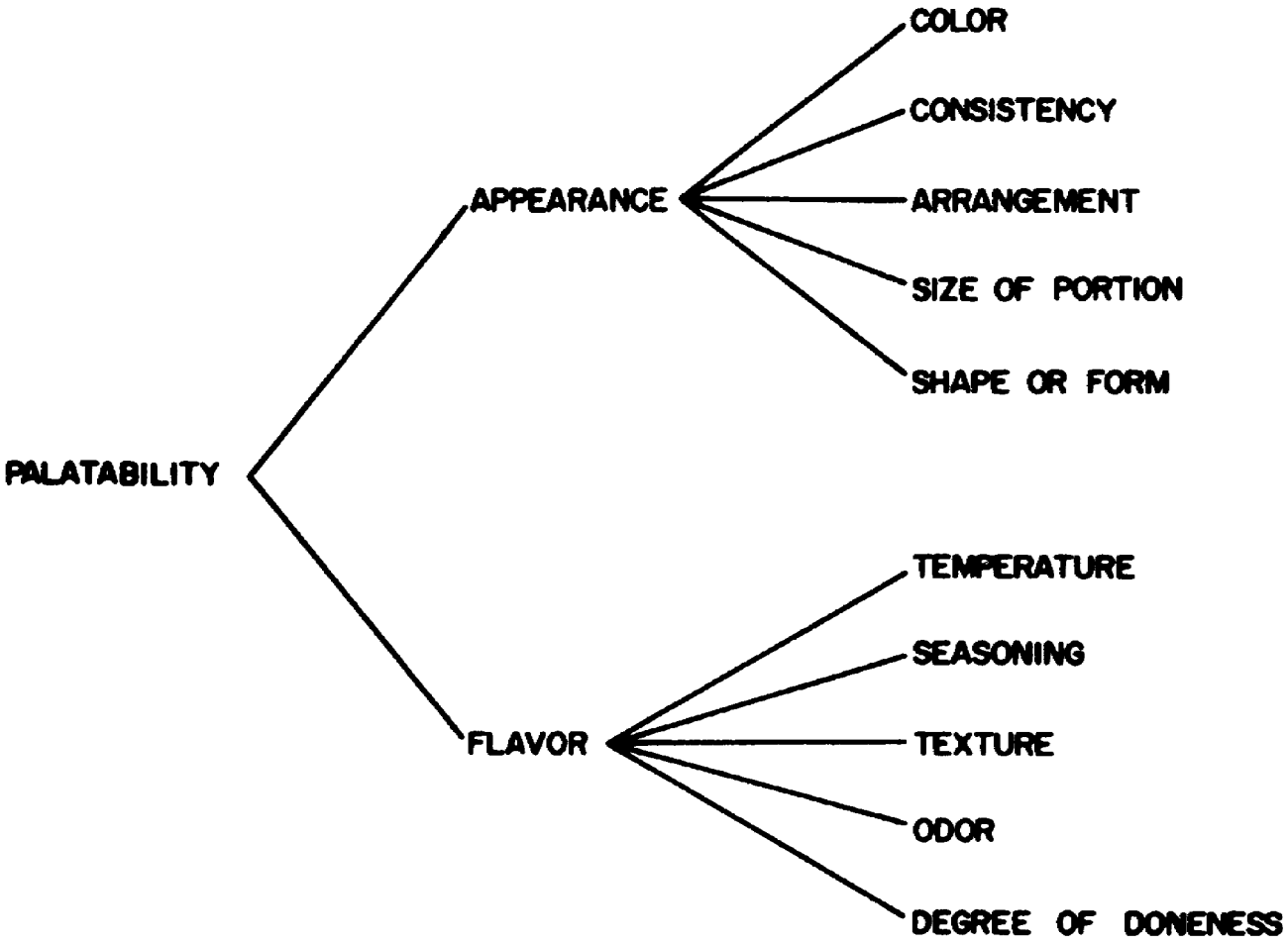

Figure 1. Factor that contribute to the palatability of foods

palatability of the food, suitable seasonings which supplement the natural flavors, and proper serving temperatures influence greatly the acceptability of all food items.

a. APPEARANCE. Appearance, a very important part of food, is a visual element to which human eyes, minds, emotions, and palates are very sensitive. A soldier is quick to make comparisons between what he sees and what he eats. The perishability of food and the length of time between preparation and serving make it necessary for the food service sergeant to incorporate control of quality in food preparation.

(1) COLOR. Control of color in food products has received much attention in recent years. The food service sergeant must realize that foods should be prepared in a manner that preserves color and that foods must be served in a manner that capitalizes on the art and psychology of food color. A sprig of parsley breaks the monotony of an otherwise colorless serving tray; mint jellies or cranberry sauce introduce color to light-colored meat; and segments of lemon help brighten fish placed in the serving line.

(2) CONSISTENCY. Consistency pertains to degree of firmness or density or to retention of form of the food being prepared. Soups, sauces, gravies, gelatins, and puddings are some of the foods that have a consistency or a cohesion of the ingredients for which standards of quality have been established.

(a) Soups are classified as thin, thick, special, and cold; each has its own consistency. The standard recipes contain quantity requirements that should be followed to obtain the acceptable consistency.

(b) Sauces are used with meats, desserts, fish, and vegetables of all kinds. All types of sauces have the same purpose--to enhance the flavor and appearance of the foods they accompany. Sauces should present a pleasing contrast in consistency, flavor, and color with the food.

(c) Gelatins are used in salads, cold soups, aspics, and desserts and are used to decorate meats. The proper consistency of each type of gelatin is obtained by close adherence to the recipe.

(d) Custards and puddings are made from ingredients that cause the consistency of the finished product to depend heavily on the cooking principles. Care must be taken in the preparation and cooking of these food items to avoid lumpy, tough, rubbery, curdled, and quivery results.

(e) Other foods such as whipped potatoes must be prepared and served in quantities that insure a generally acceptable consistency. Lightly whipped potatoes that have settled into a soggy mss are not appealing, and creamed beef that has the consistency of dough is not tempting.

(3) ARRANGEMENT. Food heaped in the serving trays is not attractive; two light-colored foods placed side by side in the steamtable lack eye appeal. The food service sergeant and the cooks must visualize the items listed on the menu as they will appear when served and make an effort to arrange the food attractively on the serving line.

(4) SIZE OF PORTIONS. Large portions of food tend to dull the appetite; small portions are not satisfying. However, the sizes of the portions to be served by dining facilities are established by the master menu, and the recipe and should present no problem.

(5) SHAPE OR FORM. Variety in shape helps create an appealing meal. Too many creamed or mashed items on the serving line are not attractive. An interesting serving line should contain one flat item, one in a mound, and one in strips.

b. FLAVOR. Flavor is more elusive to judge than appearance. It is influenced by such factors as temperature and the sensitivity of taste of the person eating the food. Flavors often change in cooking; some are lost in the steam; and others are decomposed. Some of the changes such as the browning of meat are highly acceptable, and others such as the strong flavor that develops in cabbage that is cooked long are considered unpalatable. Industry has developed many tests and analyses for quality control in the manufacture of food products. The first cook must stress the importance of following recipes and must exercise his own judgment in setting up controls for maintaining and enhancing the flavor of foods served.

(1) TEMPERATURE. To be palatable, foods and beverages should be served at their desired temperatures. Fruit cups, fruit and vegetable juices, and fruit and vegetable salads should be thoroughly chilled when served. Soups, meats, and fish should be served hot, unless the recipe indicates otherwise.

(2) SEASONING. Salts, spices, herbs, and other condiments are known as seasoning. Spices are pungent in aroma and are often pungent in flavor. Herbs are more delicate than spices in both aroma and flavor. Seasoning should be used to enhance, not

to disguise, the natural flavor of food. A knowledgeable use of seasonings is not only a means to better flavored foods, but is also a way of creating more exciting food items. For example, vegetables may have onions, herbs, nuts, or lemon added for variety. Seasoning may be used to intensify, to add to, or to enhance the flavor of foods. It is recognized that seasonings contribute few if any nutrients to the diet but do promote the palatability of other nutrient-bearing foods.

(3) TEXTURE. Texture refers to the manner of structure of foods and is best detected by the feel of foods in the mouth. Crisp, soft, grainy, smooth, hard, and chewy are some adjectives used to describe foods. A variety of textures of foods make a menu more pleasing. Experience should aid the food service sergeant in determining whether the texture of a food item is palatable.

(4) ODOR. The sense of smell is 25,000 times more sensitive than the sense of taste. Odorous compounds must contact the olfactory nerves in the nasal passage before an odor can be detected. The common odor classifications include the earthy, fruity, flowery, fishy, spicy, putrid, and oily odors. The food itself should have an odor characteristic of the product. For example, the characteristic odors of ripe bananas and melons are indicative of the flavor.

(5) DEGREE OF DONENESS. Changes in appearance, rigidity, thickness of sauces, tenderness, flavor, the length of the heating period, and the attainment of a definite temperature are the methods commonly used in determining doneness. Cakes are tested by the "toothpick" or "spring" test. Many items are done when they are cooked a definite time as specified in the recipe. The attainment of a definite internal temperature as indicated by a meat thermometer is particularly recommended for meats and poultry (fig. 2). Table 1 may be used as guide to doneness of roasted meats. Specific tests for determining the doneness of foods will be given for the various types of food covered by this text.

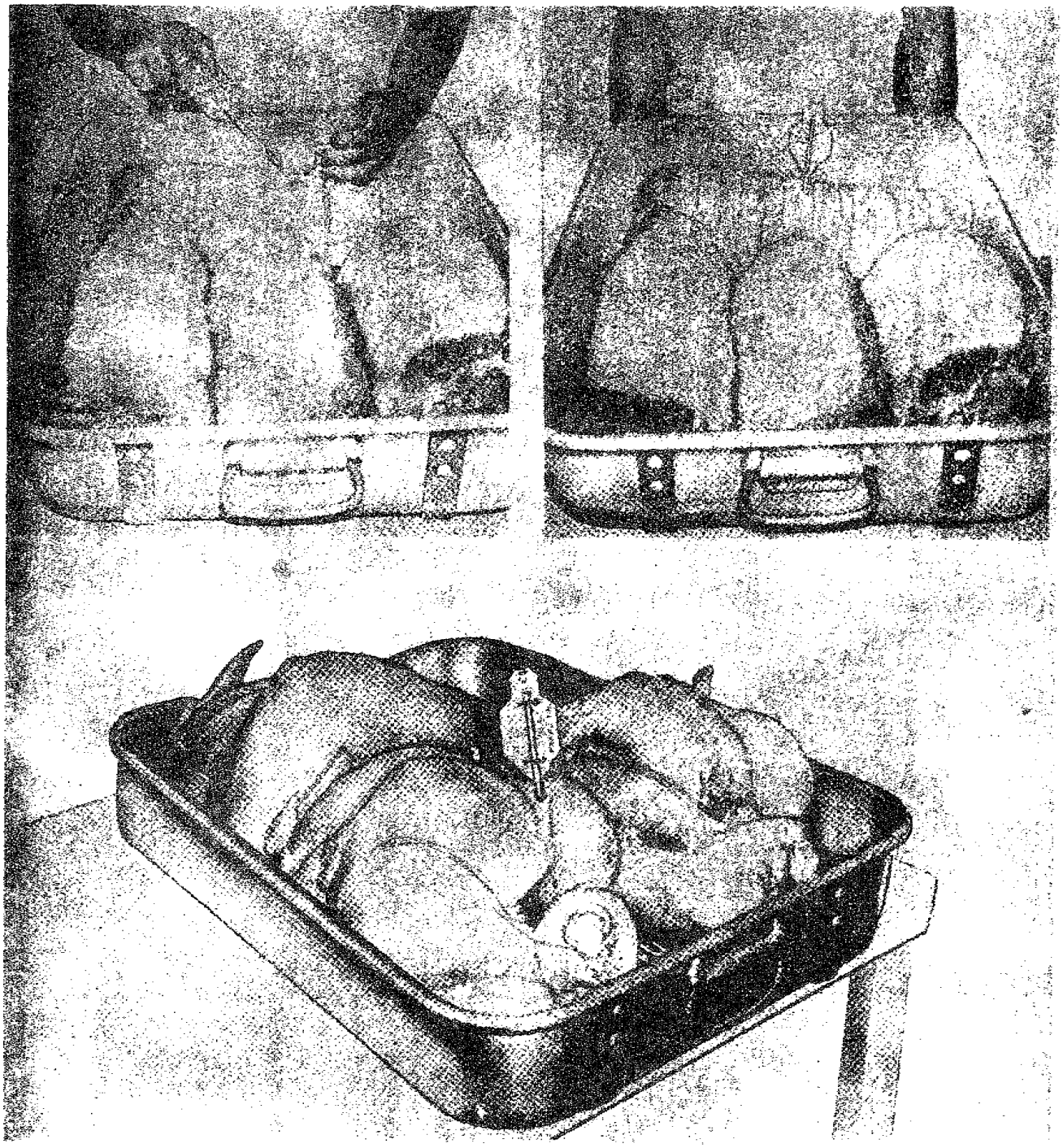

Figure 2. Meat thermometers placed in meat and poultry to measure internal temperature.

Table 1. Timetable for roasting meats

Roast	Weight each approximate (Pounds)	Oven temperature (° F)	Internal temperature (° F)	Approximate total cooking time (Hours)
Beef:				
Ribs, standing (bone-in).....	6-8	325	Rare--140.....	Varies.
		325	Medium--160.....	Varies.
		325	Well done--170..	Varies.
Boneless cuts.....	6-8	325	Rare--140.....	Varies.
		325	Medium--160.....	Varies.
		325	Well done--170..	Varies.
Pork:				
Ham, fresh.....	12-14	325	170.....	5.
Ham, smoked, boned.....	10-18	325	170.....	2 1/2-4.
Ham, canned.....	8-14	325	140.....	2.
Ham, precooked, casing type.....	8-12	325	130.....	2.
Loin (boned).....	6-8	325	*170.....	Varies.
Lamb:				
Boneless leg, loin, or shoulder..	4-6	325	170--180..... Rare--165 Medium--175 Well done--180	2-3.
Veal:				
Boneless leg, loin, or shoulder..	5	325	170.....	3-4.

* AR 40-5 states "Pork and pork products will be cooked throughout to a minimum internal temperature of 150° to kill trichina. However, an internal temperature of 170° F is recommended for fresh pork to provide a uniformly cooked product and optimum patron acceptance.

4. PROGRESSIVE COOKERY. Progressive cookery is one of the most important aspects in controlling the quality of vegetables and other food items. Progressive cookery is defined as "the cooking of food in minimum quantities and at proper intervals to meet the requirements of the serving period to insure uniform quality throughout the entire meal." Small quantities of a food item (10 pounds or less) are cooked in one vessel at different intervals as needed. In small kettles or stock pots, heat penetrates to the center of the food mass much more quickly than in a large pot, so the cooking of small batches is a timesaver. This method reduces the need for holding periods after cooking which cause rapid loss of color and flavor. Also, this method insures uniformity of cooking and reduces the chance of damaging the bottom layers of food. Fewer leftovers result, and better waste control is achieved, because the last planned batch of a slow moving item need not be cooked. Progressive cookery requires good organization of the kitchen staff and close supervision of the persons preparing and serving the items. From written records of vegetable and other food item usage at frequent and stated intervals throughout the serving period, the food service sergeant has a factual basis for determining the schedule for the progressive cookery of food items. The following suggestions for progressive cookery of vegetables should make the system workable:

a. Fix definite responsibility for progressive cookery of food items.

b. Designate the amounts to be cooked at each time to avoid the last-minute rush in determining the amount.

c. Keep an even flow of fresh batches by predetermined plan according to rate consumption of different foods.

d. Cook most vegetables until crisp-tender for best color, texture, flavor, and nutritional value.

e. To present the most attractive service, do not mix batches at the steamtable.

f. Note the specific intervals for cooking foods on the cooks' worksheet.

g. Make a general rule that when a steamtable insert pan is half empty, another cooked batch will be finishing up to replace it.

SECTION II

CONTROL OF INGREDIENTS

5. GENERAL. The quality of the food prepared in Army dining facilities can be controlled to a great extent by the strict adherence to the standard recipes. Ingredients inaccurately weighed and measured may yield unsatisfactory products. Assigning responsibility for weighing and measuring of all ingredients (fig. 3) to properly trained personnel reduces to a minimum the possibility of using incorrect amounts. Also, when adequately supervised, dining facility personnel trained in the use of the desired procedures and in the use of the recipes provided produce an acceptable food item. To produce standard products of high quality, it is important that all dining facility personnel know the sizes and yields of all pans, measures, ladles, and other small equipment used in preparing and serving the food. The provision of proper and adequate equipment for the dining facility is a responsibility of the food service sergeant.

6. RECIPES. Recipes that specify accurate amounts and procedures are important to the control of cooking. Armed Forces Recipe Service (TM 10-412) provides standard recipes which give directions for combining ingredients and for preparing and cooking the food. These recipes reflect the food preferences of the average American soldier. Each recipe is designed to yield 100 portions of the size designated (fig. 4). When standard procedures are used for accurately measuring and combining ingredients as outlined in the recipe and for properly cooking food in accordance with the recipe, a standard product should result. The standard recipes have been tested under appropriate conditions and have repeatedly produced good results. From these tests the types and sizes of the cooking equipment and the portion sizes and yields for each recipe are determined.

a. CONTENT OF THE ARMED FORCES RECIPE SERVICE (TM 10-412). The Armed Forces Recipe Service is a joint-service publication which replaced the Army TM 10-412-series publications. It is issued in card form. The general information section contains definitions of cooking terms (fig. 5), tables of weight and measuring equivalents (table 2), weights and measures for can sizes (table 3), recipe conversion (fig. 6), and other tables to help the dining facility personnel be sure that the accurate amount of ingredients are used each time a food item is prepared. Each of the other sections of this file contains recipes for the preparation and cooking of a particular type of food such as appetizers, beverages, and cereals.

b. USING STANDARD RECIPES. The food service sergeant is responsible for setting up a standing operating procedure (SOP) instructing the dining facility personnel to read and follow explicitly the directions for weighing and measuring the ingredients and for preparing and cooking the food according to the recipe. To control the quality of food prepared, cooks must--

(1) Learn the definitions of the terms used in food preparation as listed in the general section of Armed Forces Recipe Service (fig. 5).

(2) Learn the abbreviations (fig. 6) used in the standard recipes.

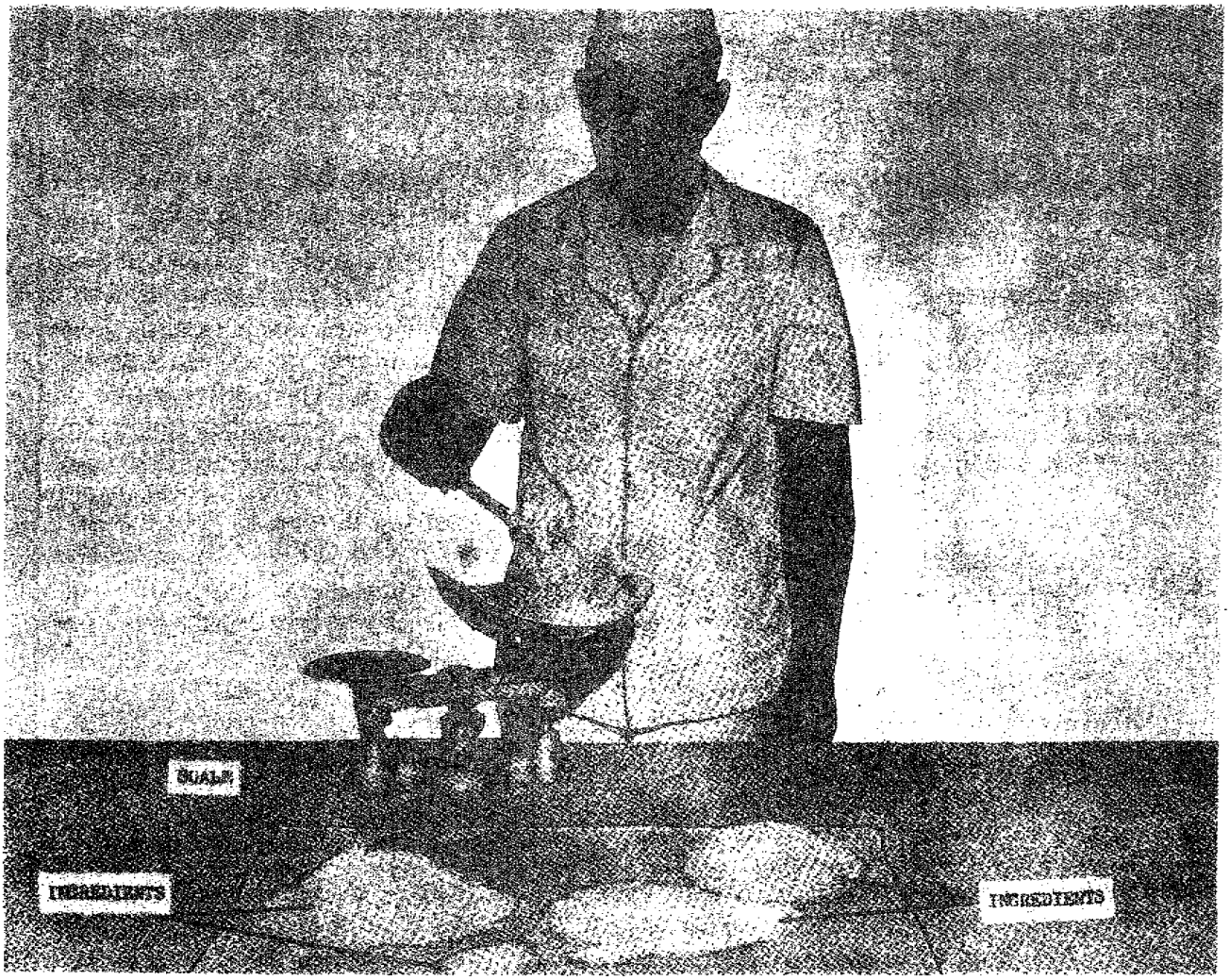

Figure 3. Weighing ingredients for a standard recipe.

COUNTRY STYLE CHICKEN
(Maryland Fried)

YIELD: 100 Portions (2 Pans)			EACH PORTION: 2 Pieces plus ⅓ Cup Gravy	
PAN SIZE: 18 by 24-inch Roasting Pan			TEMPERATURE: 325° F. Oven	
INGREDIENTS	WEIGHTS	MEASURES		METHOD
Chicken, broiler-fryer, cut-up	50 lb			1. Wash chicken thoroughly under running water. Drain well.
Flour, wheat, general purpose, sifted	3 lb	3 qt		2. Dredge chicken in mixture of flour, salt, pepper, and paprika; shake off excess.
Salt	6 oz	9 tbsp		
Pepper, black		2 tbsp		
Paprika, ground		1 tbsp		
Shortening, melted	2 lb	1 qt		3. Brown chicken in batches in shortening; overlap in rows in pans.
Water, hot		2 qt		4. Add 1 qt water to each pan; cover.
				5. Bake 1 hour or until chicken is tender.
				6. Remove chicken; reserve drippings for use in Step 7. Place chicken in serving pans.
Drippings and water, hot		1 gal		7. Add water to drippings to make 1 gal. Add Soup and Gravy base; stir to dissolve.
Soup and Gravy base, chicken	4 oz	⅓ cup (1/6-No. 2½ can)		
Milk, nonfat, dry	13 oz	2⅞ cups		8. Reconstitute milk; add to drippings; mix; heat to simmering temperature.
Water, warm		3¾ qt		
Shortening, melted	1 lb	2 cups		9. Blend shortening and flour together to make a cold roux; mix until smooth.
Flour, wheat, general purpose, sifted	1 lb	1 qt		10. Stir roux into stock; cook until thickened, stirring constantly.
				11. Serve gravy over chicken.

NOTE: 1. 65 lb chicken, broiler-fryer, whole, cut in quarters or eighths may be used in Step 1.
2. 1 gal other types of milk may be substituted for nonfat dry milk and water in Step 8. See Recipe Card A-9.
3. In Step 3, chicken may be browned in deep fat about 5 minutes at 350° F. or in 400° F. oven about 20 minutes.

Figure 4. Standard recipe for country style chicken from TM 10-412.

DEFINITIONS OF TERMS USED IN FOOD PREPARATION

Bake	To cook by dry heat in an oven, either covered or uncovered.
Barbecue	To roast or cook slowly, basting with a highly seasoned sauce.
Baste	To moisten food with liquid or melted fat during cooking to prevent drying of the surface and to add flavor.
Beat	To make a mixture smooth by using a fast regular circular and lifting motion which incorporates air into a product.
Blanch	To partially cook in deep fat, boiling water or steam.
Blend	To mix two or more ingredients thoroughly.
Boil	To cook in liquid at boiling point (212° F.) in which bubbles rise and break rapidly at the surface.
Braise	To brown in small amount of fat, then to cook slowly in small amount of liquid below the boiling point in a covered utensil.
Bread	To cover with crumbs or other suitable dry coating ingredient; or to dredge in a mixture of flour, seasonings, and /or condiments, dip in a mixture of milk and slightly beaten eggs and then dredge in bread crumbs.
Broil	To cook by direct exposure to heat.
Brown	To produce a brown color on the surface of food by subjecting it to heat.
Chop	To cut food into irregular small pieces.
Cream	To mix until smooth, so that the resultant mixture is softened and thoroughly blended.
Cube	To cut any food into square-shaped pieces.
Dice	To cut into small cubes or pieces.
Dock	To punch a number of vertical impressions in a dough with a smooth round stick about the size of a pencil to allow for expansion and permit gases to escape during baking.
Dredge	To coat with crumbs, flour, sugar, or corn meal.
Fold	To combine two or more ingredients together with a cutting and folding motion.
Fry	To cook in hot fat.
Garnish	To decorate with small pieces of colorful food.
Grate	To rub food on a grater and thus, break it into tiny pieces.
Grill	To cook, uncovered, on a griddle, removing grease as it accumulates. No liquid is added.
Knead	To fold and press dough firmly with palms of hands, turning between foldings.
Marinade	A preparation containing spices, condiments, vegetables, and aromatic herbs, and a liquid (acid or oil or combination of these) in which a food is placed for a period of time to enhance its flavor or to increase its tenderness.
Marinate	To allow to stand in a marinade to add flavor or tenderness.
Mince	To cut or chop into very small pieces (finer than chopped).
Pan-broil	To cook uncovered in a hot frying pan, pouring off fat as it accumulates.
Pare	To cut away outer covering.
Reconstitute	To restore to liquid state by adding water. Also to reheat frozen prepared foods.
Rehydrate	To soak, cook, or use other procedures with dehydrated foods to restore water lost during drying.
Roast	To cook by dry heat; usually uncovered, in an oven.
Sauté	To brown or cook in small amount of fat.
Scale	To measure a portion of food by weighing.
Score	To make shallow cuts across top of a food item.
Seasoned Flour or Crumbs	A mixture of flour or crumbs with seasonings.
Shred	To cut or tear into thin strips or pieces using a knife or a shredder attachment.
Sift	To put dry ingredients through a sieve.
Simmer	To cook in a liquid just below the boiling point (190° F.-210° F.); bubbles will form slowly and break below the surface.
Steam	To cook over or surrounded by steam.
Stew	To simmer in enough liquid to cover solid foods.
Stir	To blend two or more ingredients with a circular motion.
Temper	To remove from freezer and place under refrigeration for a period of time sufficient to facilitate separation and handling of frozen product. Internal temperature of the food should be approximately 26° F. to 28° F.
Thaw	To remove from freezer and place under refrigeration until thawed. Internal temperature should be above 30° F.
(a) Completely Thaw	To remove from freezer and place under refrigeration approximately 48 hours before intended use.
(b) Partially Thaw	To remove from freezer and place under refrigeration approximately 18 hours before intended use.
Toss	To mix ingredients lightly.
Whip	To beat rapidly with wire whip to increase volume by incorporating air.

Figure 5. Definitions of terms used in food preparation.

TABLE OF WEIGHT AND MEASURING EQUIVALENTS

TSP	TBSP	OUNCES	CUPS	SCOOPS	LADLES	FLUID MEASURE	LB WEIGHT
3	1	½					
	2	1	⅛	1-#30	AA		
	4	2	¼	1-#16	A		
	5	2½	⅓	1-#12			
	6⅔	3½-4	2/5	1-#10			
	8	4	½	1- #8	B		
	10	5	⅔				
	12	6	¾				
	14	7	⅞				
	16	8	1		D	½ pt	
	18	9	1⅛				
		12	1½			¾ pt	
		16	2			1 pt	1 lb
		24	3			1½ pt	
		32	4			1 qt	
		64	8			2 qts	4 lb
		128	16			1 gal	8 lb

NOTE: Use ladles to serve individual portions of liquid or semiliquid foods.

Table 2. Weight and measuring equivalents from Armed Forces Recipe Service

TABLE OF WEIGHTS AND MEASURES FOR CAN SIZES

CAN SIZE	AVERAGE NET WEIGHT OR FLUID MEASURE PER CAN (SEE NOTE)	AVERAGE CUPS PER CAN	CANS PER CASE	APPROX. NO. CANS EQUIV. TO NO. 10 CN
No. 10	6 lb 8 oz	12½	6	1
No. 3 cyl	3 lb 2 oz (46 fl oz)	5¾	12	2
No. 3 (vacuum)	1 lb 7 oz	2¾	24	4½
No. 2½	1 lb 12 oz	3½	24	4
No. 2	1 lb 4 oz	2½	24	5
No. 303	1 lb	2	24	7
No. 300	14 oz	1¾	24	7
No. 2 (vacuum)	12 oz	1½	24	8
No. 1 picnic	11 oz	1⅛	48	10

NOTE: The net weight on can or jar labels differs among foods due to different densities of foods. For example: A No. 10 can contains 6 lb 3 oz sauerkraut or 7 lb 5 oz cranberry sauce. Meats, fish, and shellfish are known and sold by weight of contents of can. For net weight listings of specific foods, check the conversion factor column in the Federal Supply Catalog, FSC Group 89, Subsistence.

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Table 3. Weights and measures for can sizes from Armed Forces Recipe Service.

RECIPE CONVERSION

All recipes in this file are designed to produce 100 portions. The portion size is noted in the upper right corner of each recipe. Since few dining facilities serve exactly 100 men, and, in some instances the acceptable size portion may be smaller or larger, it is often necessary to reduce or increase a recipe. You may adjust the recipe to yield the number of servings needed, or to use the amount of ingredients available, or to produce a specific number of smaller portions. You may pencil in your computations in the blank column on the recipe card.

In the Weights Column on each recipe card, the quantities of items needed are listed as ____lb, _____ oz or _____lb _____oz. When increasing or decreasing a recipe, the division or multiplication of pounds and ounces is simplified when decimals are used.

To convert the quantities to decimals, use the table:

Weight in Ounces	Decimal of Pound	Weight in Ounces	Decimal of Pound
1	.06	9	.56
2	.13	10	.63
3	.19	11	.69
4 (¼ lb)	.25	12 (¾ lb)	.75
5	.31	13	.81
6	.38	14	.88
7	.44	15	.94
8 (½ lb)	.50	16 (1 lb)	1.00

For example: 1 lb 4 oz is converted to 1.25 lb

1. To adjust to yield a specific number of servings:
   First —Obtain a working factor by dividing the number of servings needed by 100. For example:
   348 (servings needed) + 100 = 3.48 Working Factor

   Then—Multiply the quantity of each ingredient by the working factor. For example:
   1.25 lb (recipe) × 3.48 Working Factor = 4.35 lb (quantity needed)
   The part of the pound is converted to ounces by multiplying the decimal by 16. For example:
   .35 lb × 16 ounces = 5.60 ounces

   After the part of the pound has been converted to ounces, use the following scale to "round off":

   .01 to .12 = 0
   .13 to .37 = ¼ ounce
   .38 to .62 = ½ ounce
   .63 to .87 = ¾ ounce
   .88 to .99 = 1 ounce

   Thus 5.60 ounces will be "rounded off" to 5½ ounces and 4 lb 5½ ounces will be the quantity needed.
2. To adjust the recipe on the basis of a quantity of an ingredient to be used:
   First —Obtain a Working Factor by dividing the pounds you have to use by the pounds required to yield 100 servings. For example:
   102 lb ÷ 30 (lb per 100 servings) = 3.40 Working Factor
   Then—Multiply the quantity of each ingredient in the recipe by the Working Factor.
3. To adjust to yield a specific number of servings of a specific size:
   First —Divide the desired portion size by the standard portion of the recipe.
   3 oz (desired size) ÷ 4 oz (standard portion) = .75
   348 (servings needed) × .75 = 261
   261 ÷ 100 = 2.61 Working Factor
   Then—Multiply the quantity of each ingredient in the recipe by the Working Factor.

RECIPE ABBREVIATIONS

tsp—teaspoon	gal—gallon
tbsp—tablespoon	oz—ounce
pt—pint	lb—pound
qt—quart	A.P.—As Purchased
cn—can	E.P.—Edible Portion

UNLESS OTHERWISE SPECIFIED IN THE INGREDIENTS COLUMN, THE E.P. WEIGHT IS USED FOR ALL ITEMS LISTED ON EACH RECIPE CARD.

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Figure 6. Recipe conversion procedures.

(3) Learn the procedures for weighing and measuring ingredients (page 7).

(4) Assemble all equipment and ingredients needed before beginning preparation.

(5) Check the cooking time and temperature chart.

(6) Follow the step-by-step instructions for preparing the food.

c. CHANGING THE QUANTITIES OF A RECIPE. Armed Forces Recipe Service gives recipe conversion procedures (fig. 6) to be used in determining the correct amount of each ingredient when the anticipated number of persons to be fed requires more or less than the standard 100 portions. The following precautions should be taken to insure the quality of the finished product is that intended by the recipe:

(1) Write new amounts of ingredients on a separate piece of paper; do not trust them to memory.

(2) Do not increase a recipe more than double. If the number of servings is to be more than double the recipe, prepare the quantity needed in batches of not more than 200 servings (double the recipe).

(3) Do not reduce the recipe more than 50 servings (half the recipe).

(4) Change the cooking time, cooking temperature, and size of the pans, as appropriate, when more or less than the standard recipe is being prepared.

7. WEIGHING AND MEASURING INGREDIENTS. Accurate amounts of all ingredients are specified in the standard recipes. The ingredients with weight and measure, as appropriate, are listed in the order in which they should be used. As a general rule, greater accuracy is obtained if dry ingredients are weighed and liquid ingredients are measured. However, small quantities of dry ingredients in a recipe are often measured, since many scales do not weigh small quantities with accuracy. There is less loss of food when the appropriate method is used for gauging amounts of ingredients. The measuring procedure front the Armed Forces Recipe Service is shown in figure 7. The food service sergeant should insure that all dining facility personnel are aware that accurate amounts of ingredients result in better products. Listed below are some other suggestions for weighing and measuring ingredients.

a. WEIGHING. The scales used for weighing ingredients must have an accurate balance. Unless the balance is very sensitive, it is better to measure ingredients used in small amounts such as salt, soda, baking powder, and spices even if other ingredients are weighed. Dried eggs and dry milk should always be weighed for best accuracy, not measured. Also all solid fats (butter, shortening, lard, and rendered fat) should be weighed for best accuracy. If butter is available in 1-or 1/4-pound prints, these measurements may be used. One-pound prints are equivalent to 2 cups and 1/4-pound prints, to about 1/2 cup.

b. MEASURING. Volume measurements are reasonably accurate if the utensils are standard and if care is taken to follow recommended procedures for putting a definite weight into a given volume (fig. 7). Sets of cups of 1/4-, 1/3-, 1/2-, and 1 -cup capacity without headspace are used as appropriate for measuring dry ingredients. Liquid ingredients should be measured in a clear glass or plastic measuring cup that has headspace and has clearly marked fractions so the level of the liquid can be reed. The cup must rest on a level surface, and the quantity must be read at eye level to obtain an accurate liquid measure. The headspace permits the cook to move a cupful of liquid without spilling it. Because oils and syrups cling to the measuring cup, a spoon or rubber scraper should be used to remove liquid remaining in the measurer.

MEASURING PROCEDURE **A. GENERAL INFORMATION No. 3**

Weights are more accurate than measures and recipe ingredients should be weighed whenever possible. If scales for weighing are not available, follow the rules for measuring to insure accurate measures.

Flour	**When specified, sift before measuring. Place flour lightly in measuring utensil. Level with straight edge of knife. Do not shake utensil; do not pack flour.**
Sugar, granulated	**Fill measuring utensil without shaking. Level with straight edge of knife. If sugar is lumpy, sift before measuring.**
Sugar, brown	**When specified, pack firmly into measuring utensil. If sugar is lumpy, roll with a rolling pin to break up any lumps before measuring.**
Milk, nonfat, dry	**Stir lightly with a fork or spoon. Place lightly in measuring utensil. Do not shake utensil. Level with straight edge of knife.**
Baking powder and spices	**Stir lightly with fork or spoon. Dip dry measuring spoon into container, bringing it up heaping full. Level with straight edge of knife.**
Solid fats	**Press fat firmly into measuring utensil. Level with straight edge of knife.**

Figure 7. Measuring procedures for recipe ingredients.

SECTION III

CONTROL TECHNIQUES

8. GENERAL. Variations in the technique of food preparation are often more difficult to control than variations in the type and amount of food used. Air, water, and heat are important factors in food preparation, but they are not independent of each other, and they may affect more than one quality of a food. Mixing of the ingredients and cooking are two phases of food preparation in which these factors contribute to the quality of the finished product. The food service sergeant must insure that personnel responsible for preparing and serving meals are aware of the influences that air, water, heat, the method of mixing, and the method of cooking have on the palatability and acceptability of food items. Some of these influences and some techniques for controlling them are discussed in this section.

9. METHODS OF MIXING. The four methods of mixing are stirring, beating, folding, and blending. Each recipe specifies the mixing method to be used to obtain the best results; if one method is substituted for another, the results may not be satisfactory. When the mixing techniques are controlled by use of an electric mixer, the effects of individual differences such as pattern or force of strokes are decreased. The standard recipe indicates the speed and length of time the electric mixer should be used to obtain the desired result. Air is purposely whipped into some foods like egg white, whipped cream, and other foams. Some foods change flavor and others become undesirable when they are aerated. The nutritive values of fruit juices may be decreased if juices are aerated and held for a long time before being served. The food service sergeant must insure that the dining facility personnel thoroughly understand and use the proper method of mixing so that the quality of the food served meets the standard.

a. STIRRING. Stirring is passing a spoon or other implement through a substance, with a continuous circular movement for the purpose of mixing, blending, dissolving, or cooling. The main purpose of stirring is to mix ingredients.

b. BEATING. Beating is bringing the bottom mass constantly to the top, trapping as much air as possible into the mixture. Dining facility personnel must be made aware of the importance of beating a mixture for the time called for in the recipe to obtain best results.

c. FOLDING. Folding is blending thoroughly without losing any of the air previously worked into the material by beating. A large utensil must be used, and only a small amount of the ingredient to be folded into beaten mass is added at a time. Folding should be done by hand to obtain the desired result, but standard recipes for food items like sponge and angel food cakes allow for use of electric mixers.

d. BLENDING. Blending is mixing thoroughly two or more ingredients.

10. METHODS OF COOKING. To cook is to subject foods to the action of heat to make them more digestible. Meats are cooked by either dry or moist heat methods, depending on the cut of meat. Vegetables are generally cooked by one of three methods: baking, steaming, or cooking in water. Baking is the primary method for cooking breads, quickbreads, cookies, pies, cakes, and other pastries.

a. DRY HEAT. Methods of cooking meat in which air surrounds the meat and evaporation is permitted are termed dry-heat methods. Dry heat is used in roasting or baking, broiling, pan-broiling, sautéing, deep-fat frying, and grilling the more tender cuts of meat. Meats cooked by dry-heat methods usually come in contact with a hot surface, such as the frying pan during the browning or actual cooking process or the baking utensil when meat is dry-heat cooked in the oven. If the following procedures are used for cooking meat by a dry-heat method other than deep-fat frying, quality products should result:

(1) Do not allow the transfer of heat through the pan at too rapid a rate, or the meat may burn on the bottom before the top is browned sufficiently.

(2) When cooking a roast by the dry-heat method, it should be placed on a rack, fat side up then into a pan with low sides and roasted at a constant oven temperature of 325° F.

(3) Do not overheat meat because overheating causes protein in the meat to toughen and become less digestible.

(4) When cooking a roast by a dry-heat method, do not cover the roast.

(5) Turn boneless roasts frequently to prevent dryness. Never stick a fork in a roast, or the juices will cook out.

(6) Often baste roasting fowl with the drippings to prevent dryness.

(7) When pan-broiling meat, do not allow fat to accumulate in the pan, or the meat will fry and become a less desirable product.

(8) When broiling meats, do not salt them, because sit tends to draw out the meat extractives. Salt also retards the browning process, which may result in excessive cooking to produce the desired color.

b. MOIST HEAT. Moist-heat cooking is the method of cooking meet in liquid or steam. Simmering, braising, stewing, and steaming are the moist-heat methods. Moist heat is required to make tender those meat cuts which contain large amounts of connective tissue. The containers used for cooking meats by the moist-heat method are usually covered to reduce the cooking time and to preserve the flavor of the meat. If the following procedures are used for cooking meat by the moist-heat method, quality products should result:

(1) When browning meats by the braising method, use moderate to high heat to develop the brown color and roasted flavor as rapidly as possible so as to prevent excessive shrinkage.

(2) When cooking meats in water or other liquid, cover the meat with the liquid so the meat will cook evenly.

(3) Season the meat during the cooking process to allow the seasoning to cook into the meat and enhance the flavor of the meat and the stock.

c. DEEP-FAT FRYING. Deep-fat frying is a dry-heat method of cooking in hot shortening heated to 350° to 365°F., depending upon the type of food. A thermometer should be used to control the temperature, because the shortening heated to the smoking point or beyond develops acrolein, which has an acrid flavor and an irritating odor. Once shortening is overheated, it should not be used. Breaded items such as meat croquettes, poultry, fish, onions, eggplant, cauliflower, and parsnips may be cooked by deep fat frying. Parsnips should be steamed or boiled until tender before they are breaded. Potatoes, corn fritters, and doughnuts may also be cooked by this method, but they do not require breading. If the following procedures are used, as applicable, for deep-fat frying, quality products should result:

(1) Inspect shortening to determine if it is clean and suitable for use.

(2) Bread the items so that their surfaces will not burn. Thoroughly coat the items with any of the various breadings such as flour, corn meal, or bread crumbs so they will brown evenly.

(3) Shake the items before they are put into the fry basket so that excess breading will not shake off and settle to the bottom of the shortening and burn.

(4) Use pieces that are as uniform as possible.

(5) Do not overfill the fry basket or the temperature of the shortening will be reduced, the cooking time will be increased, and the resulting product will be greasy and unappetizing.

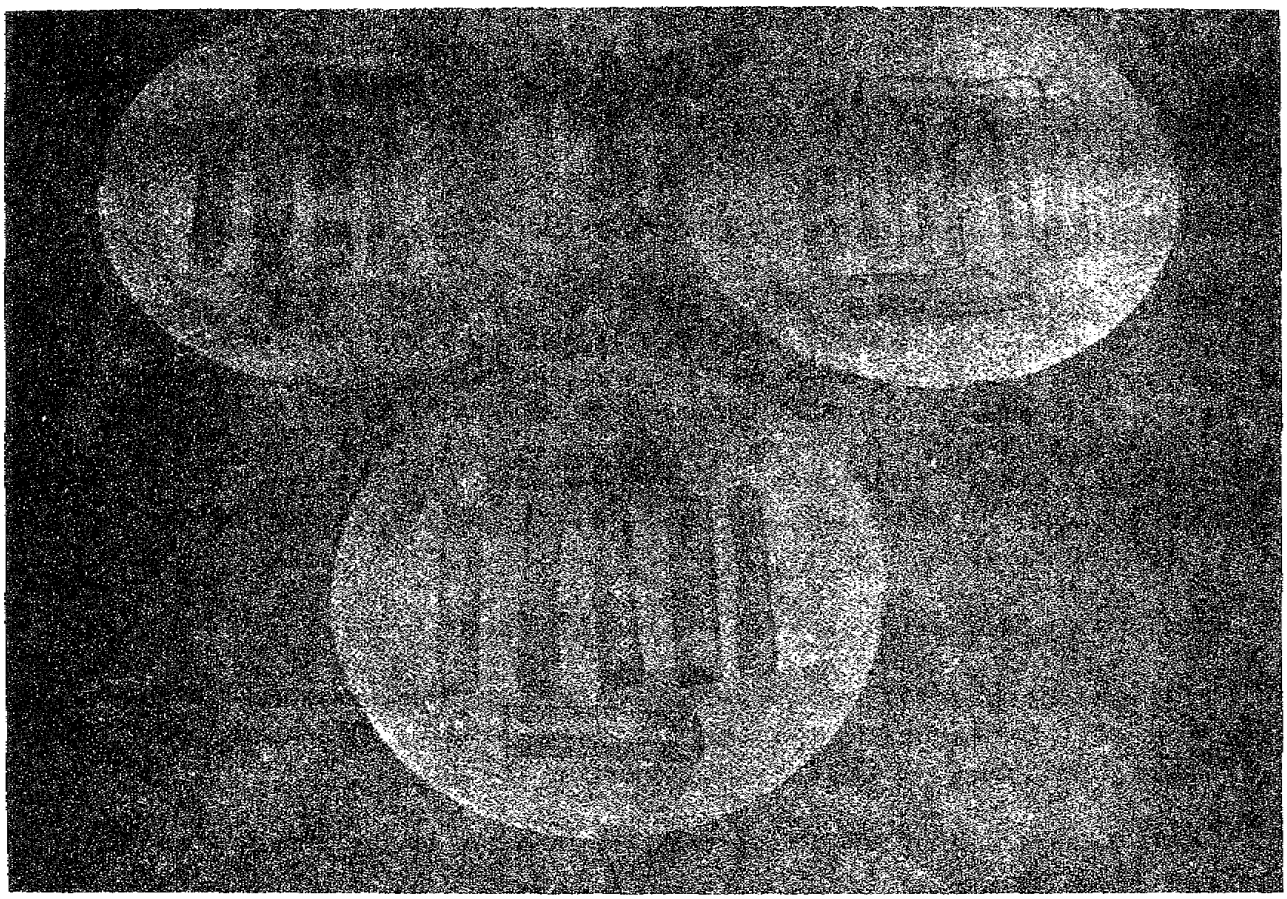
(6) Do not overbrown the items, or they will become dry and tasteless (fig. 8).

(7) Food items should be allowed to drain to retain their crispness and at the same time allow for better digestion.

(8) Too many items should not be fried at one time, because the temperature of the fat will be reduced so low that the pieces will cook evenly and will absorb excess fat.

d. STEAMING. Steaming is cooking in a steam media with or without pressure. When the steaming method is used, there is little loss in minerals and vitamins, and the vegetables retain their original shape. The exact cooking time varies, depending on the variety and maturity of the vegetable and the size of the pieces.

e. COOKING IN WATER (BOILING). Boiling is the most commonly used method of cooking vegetables. All vegetables, except the strong flavored vegetables such as broccoli, brussels sprouts, cabbage, cauliflower, kohlrabi, and onions should be cooked in just enough water to keep the cooking utensil from boiling dry.



A. HIGH TEMP. (overbrown and dry)

B. LOW TEMP. (oily)

C. CORRECT TEMP. (light and crisp)

Figure 8. Comparison of potatoes deep-fat fried at different temperatures.

The production schedule should indicate cooking time for progressive cookery as a control of quality, color, and eye-appeal of these items. The following suggestions should aid personnel in obtaining a quality product:

(1) Heat the water to boiling, and salt it before adding vegetables.

(2) Bring the water back to a boil as quickly as possible.

(3) Simmer until just tender.

(4) Drain and serve at once.

f. BAKING. Baking is done using dry heat in an oven; little or no water is used. Baking of meat is usually called roasting. Baking is considered the best cooking method for preserving the flavor and nutrients of vegetables. Breads, quickbreads, cookies, pies, cakes, and other pastries are baked. Baking time depends upon the size of the item, the temperature of the oven, the type of item, and the particular ingredients used. Listed below are a few techniques for controlling the quality of all types of baked products.

(1) MEATS. See a above.

(2) VEGETABLES. White potatoes, sweet potatoes, onions, and tomatoes are particularly adaptable to baking. Vegetables that can be baked in their skins will have better flavor and will be more nutritious; however, if the vegetables are properly pared, they will lose only a small amount of nutrients. Pared vegetables and sliced raw vegetables may be baked in a casserole. To control the quality of baked vegetables, the cook must be careful not to overbake or scorch the items.

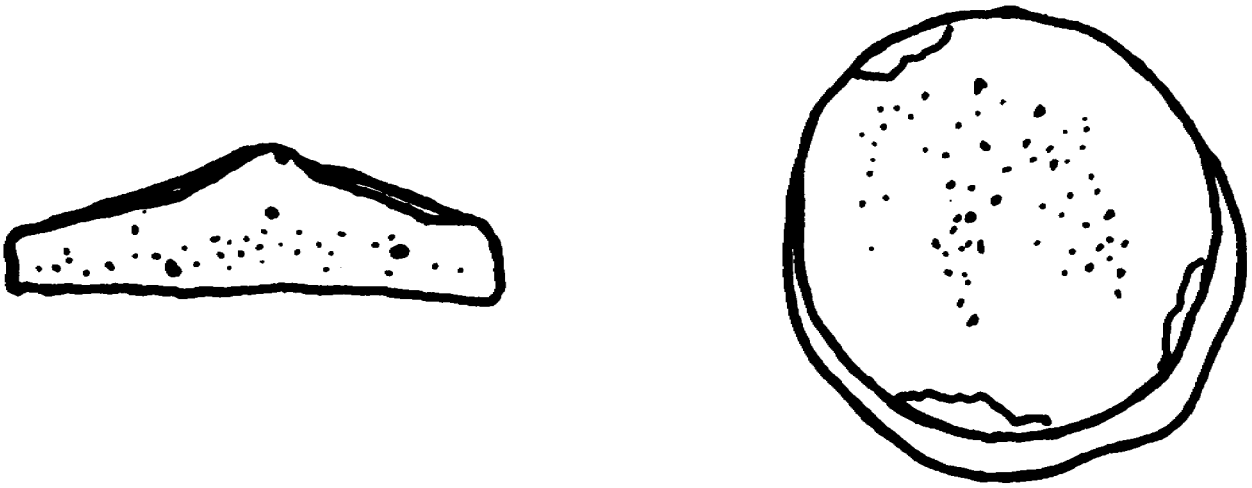
(3) CAKES AND OTHER ITEMS. The baking of cakes, breads, and other like items involves a complicated series of chemical and physical reactions. Because each ingredient and each step of the preparation contributes at least one characteristic to the finished product, it is important that the baking instructions given with the recipe be followed very closely to prevent failures (fig. 9). Listed below are other suggestions that should help in controlling the quality of baked foods.

(a) Preheat the oven about 30 minutes before using to insure the correct oven temperature.

(b) Do not overcrowd the oven--allow room for the air to circulate.

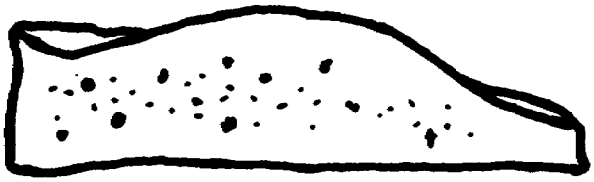
(c) Do not remove cakes from the oven until they are done. Test the cake as outlined in paragraph 2b(5).

(d) Do not overbake, or the product will be dry and unsatisfactory.



Example of a battercake baked in too hot an oven.

Example of a cake baked at too low temperature.



Misshapen cake resulting from uneven oven floor.

Figure 9. Cake failures resulting from improper baking conditions.

11. CONTROL OF OXIDATION. The effects of oxygen, one of the principal elements of air, are often overlooked in food preparation. Oxygen is a very reactive gas that forms chemical unions with many substances, a process called oxidation. The oxidized food products may be undesirable from a nutritional or a palatability standpoint-often both. Listed below are some current ideas on the effects of air on the quality of food items with some suggestions for controlling these effects.

a. Because ascorbic acid is particularly susceptible to oxidation, care should be taken to prevent unnecessary exposure of broccoli and other ascorbic-acid-rich foods to air.

b. The rate of oxidation of foods is greater at room temperature than at refrigerator temperatures. Therefore, refrigeration or freezing temperatures should be used for storing most foods containing ascorbic acid.

c. Ascorbic acid in the presence of other acids is less susceptible to oxidation changes than when alone. Citrus fruits, strawberries, and tomatoes contain other acids and resist oxidation of ascorbic acid to a greater extent than do cabbage, greens, broccoli, and cauliflower.

d. A covering of sugar or syrup over prepared fruits, tight covers on juice containers, and other similar practices reduce oxidation by limiting the amount of oxygen coming in contact with the food.

e. The ascorbic acid-citric acid combination in lemons, oranges, and other citrus fruits can be used as an antioxidant to prevent the browning of sliced bananas, apples, peaches, and other light-colored fruits.

f. Copper sieves or other metallic utensils containing traces of copper should not be used for straining fruit juices or for pureing fruits and vegetables which contain ascorbic acid, because copper increase the rate of oxidation.

g. Oxidation decreases the nutritive value of vitamin A.

h. Fats are also changed by oxidation. Oxidized fat develops an unpleasant odor and becomes rancid.

12. COOKING TEMPERATURE AS A CONTROL OF QUALITY. The temperature at which food is cooked is one of the most important factors in the quality control of the food. Using the temperature listed in the standard recipe is the best assurance of quality control. The heat must penetrate to the center of the food if the entire item or pan of an item is to be cooked. The shorter the distance to the center, the more quickly the food will cook or cool. Therefore, the food service sergeant must insure that close attention is paid to the temperature used to cook foods. Listed below are some current views on the reaction of foods to excessive heat.

a. MEAT SHRINKAGE. Cooking meat slowly at temperatures ranging from 300° to 350° F. yields the greatest number of servings and improves the appearance and nutritive value of the finished food. Tests have shown that cooking losses due to

shrinkage are only about 10 to 15 percent when meat is cooked t an oven temperature of 250° to 325° F. Figure 10 shows the results of cooking one roast at 500° and another at 325° F.

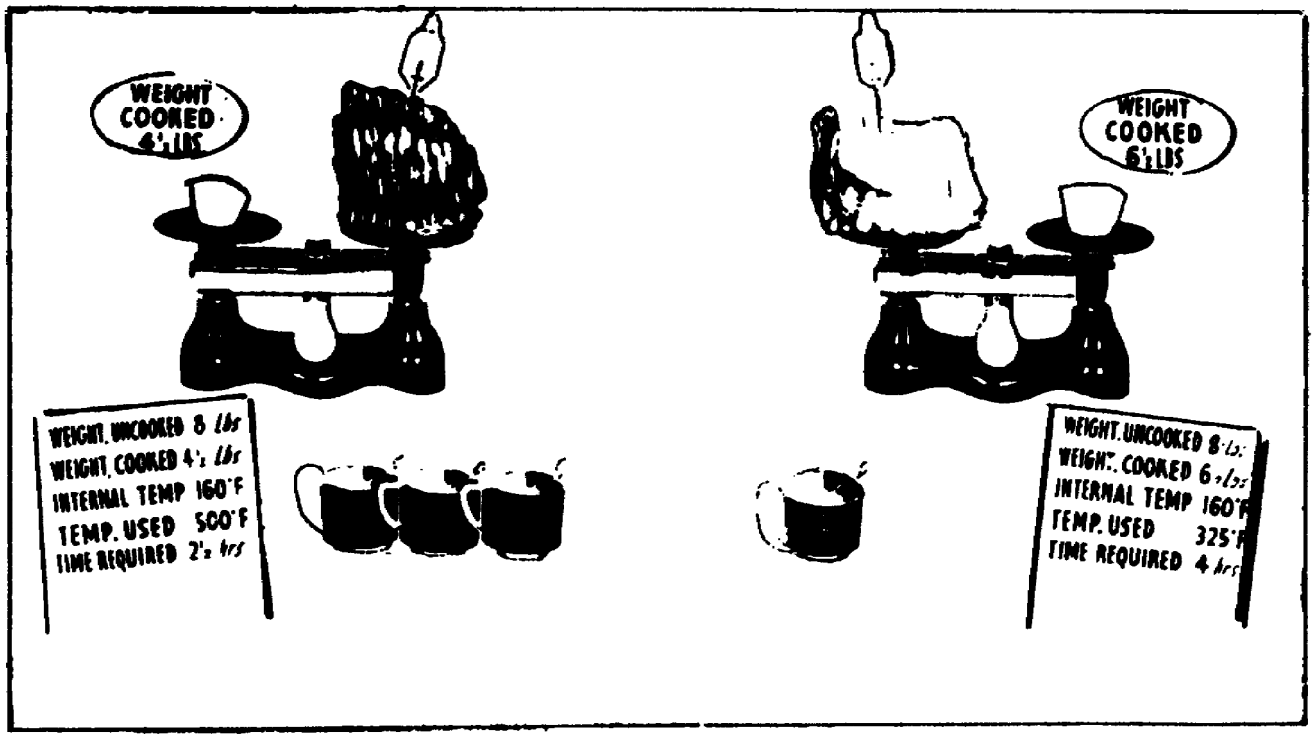


Figure 10. Comparative results of cooking meats at different temperatures.

b. DETERIORATION OF FATS AND OILS. Fats and oils, due to their refining methods, do have different smoking points and should be used accordingly. It is recommended that most deep fat frying be done at 350° F to 365° F.

c. CHANGES IN PROTEIN. Excessive heating impairs the nutritive value of protein, and most often overly heated protein is not readily digestible. Some results of changes in proteins are:

(1) Poultry baked at high temperatures becomes stringy, tough, and unappetizing.

(2) Eggs must be cooked at low temperatures. Improperly cooked egg of any type will be rubbery and tough and will be less appetizing and less digestible than eggs cooked at the proper temperatures.

(3) When excessive heat is used for scrambling eggs, the liquid is expressed, resulting in a watery finished product.

(4) If eggs are boiled at high heat, the yolks will turn dark (fig. 11).

(5) If souffles are cooked at too high a temperature, they will droop.

(6) If custards are cooked at too high a temperature, they will curdle and weep.

d. VITAMIN LOSSES. Vitamin losses occur as follows:

(1) The fat-soluble vitamins (A, D, E, and K) are relatively stable when heated in the absence of air, but losses occur when these vitamins are heated in the presence of oxygen. Prolonged heating at high temperature in the presence of air can be expected to destroy completely these nutrients. Quality changes in the food items resulting from vitamin losses can be detected by our senses.

(2) Vitamin B_1 is very sensitive to heat; if food containing it is heated in the presence of air and light, large losses in this nutrient result.

13. USE OF WATER AS A CONTROL OF QUALITY. Water is another important factor in quality control of food preparation. It surpasses all other cooking liquids in its capacity to change the physical and chemical structure of plant materials and animal tissues used for food. Many foods are washed with water, cooked with water, or moistened with water. Colors, flavors, acids, sugar, some proteins, minerals, and certain vitamins (B-complex vitamins and ascorbic acid) may be dissolved into the water that comes in contact with cut or bruised surfaces. When skins are pared away, some of the cells are ruptured, and cellular materials may be dissolved if the food is washed or covered with water. Therefore, foods to be washed should be left whole whenever possible in order to retain their water soluble substances. Procedures for cooking must be chosen according to whether the water added for the cooking process is to be used or discarded.

a. EFFECTS OF WATER COMPOSITION. The composition of water has considerable effects on foods cooked in water. The hardness of water is due to various combinations of salts. Some of the effects of hard and soft water on the quality of the cooked product are:

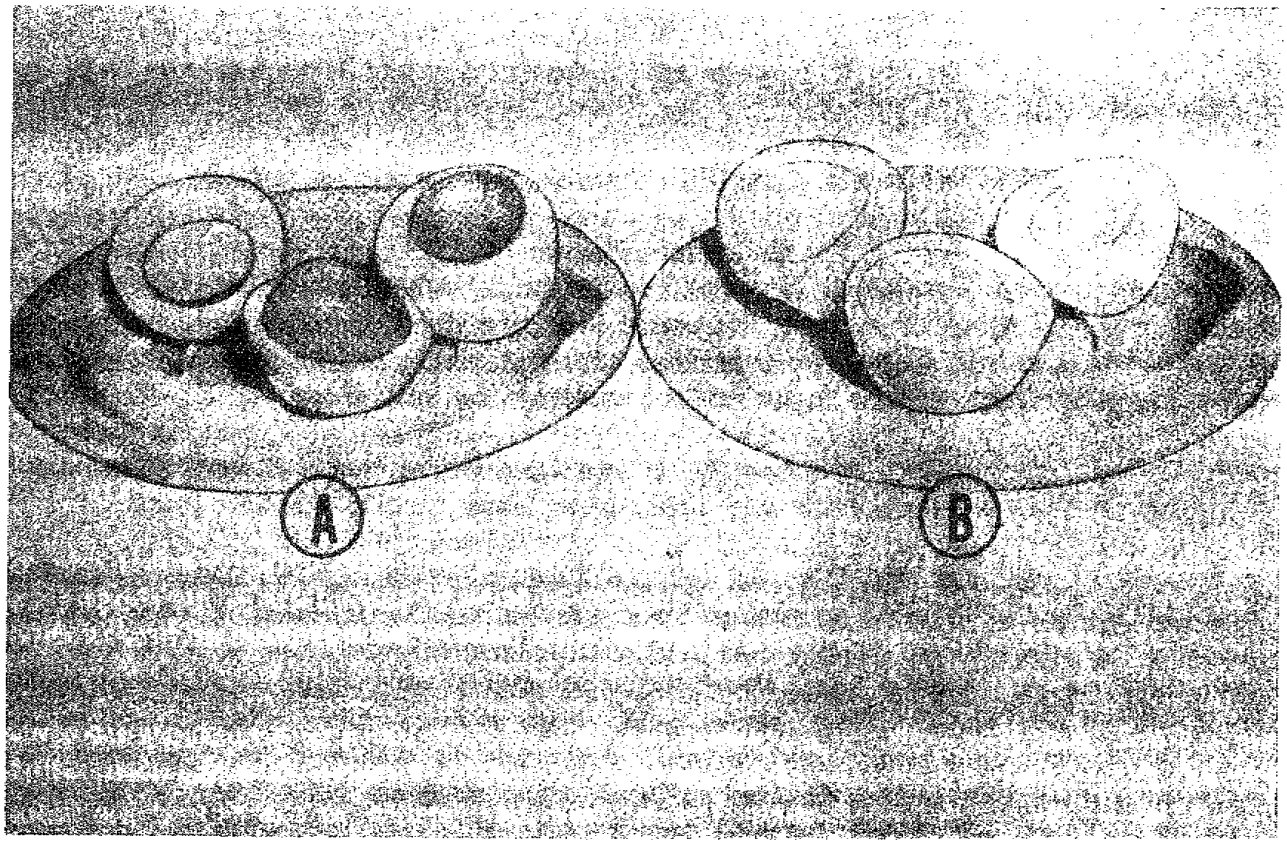
(1) Hardness of water partially determines the time required for cooking and the quality of the cooked product.

(2) Soft water causes vegetables to develop a mushy texture if the cooking time is not reduced.

(3) Coffee brews are sensitive to water softness and hardness.

(4) Soft water makes yeast doughs soggy and sticky.

(5) Hard water alters the color of vegetables of the cabbage family and causes cauliflower, potatoes, and rice to turn yellow.



A. HIGH TEMP. (outside of yolk, dark green)

B. LOW TEMP. (outside of yolk, yellow)

Figure 11. Comparison of eggs boiled as different temperatures.

b. COOKING VEGETABLES WITH WATER. Some suggestions for use of water in cooking vegetables are:

(1) Use the minimum amount of water necessary to preserve flavor and food value.

(2) Start with boiling salted water.

(3) Do not let vegetables soak before cooking, except for some dried legumes.

(4) Do not stir air into the water while food is cooking.

(5) Do not let vegetables stand in hot water after cooking. The vegetables will continue to cook, become extremely soft, and lose their natural color.

c. COOKING MEAT WITH WATER. Water or other liquids are used in moist heat cooking of meats. When water is used, the following suggestions should be observed to control the quality of the finished meat dish:

(1) Only a very small amount of liquid is used for braising meat that has been browned. If additional water is needed to prevent the meat from cooking dry and scorching, it should be added in very small portions.

(2) For stewing meat, a little more water is needed than for braising meat.

(3) For simmering soup stock and large, unbrowned pieces of meat, the amount of water should be just enough to cover the meat. If an excess is used, the flavor of both the meat and the broth will be diluted.

SECTION IV

CONTROL OF STORAGE

14. GENERAL. Periodic inspections of the foods stored for use in the dining facility are indispensable tools for controlling the quality of the food to be served. The Amy buys high-quality food products, and the food service sergeant must provide controls to insure that they are used properly. Carelessness in caring for and storing foods after they are brought into the dining facility may result in various forms of deterioration and spoilage such as withering, discoloration, molding, and decay. Foods are usually delivered to the dining facilities in 2-day and 3-day increments. Nonperishable subsistence is stored on shelves as illustrated in figure 12. Since excess nonperishable items are turned in twice a month, the most important quality controls for these items are visual inspection and rejection of items at the time of receipt, and inspection of stored items for contamination, insect and rodent infestation, or spoilage.

15. CONTROL PRACTICES. The food service sergeant, assistant food service sergeant, or other authorized dining facility personnel must inspect foods received at the dining facility. If any food seems to be unfit for human consumption, the veterinarian should be notified. When any food must be returned, the food service sergeant must make a request for immediate replacement. The food service sergeant must instruct personnel authorized to receive and store supplies on the practices important to the surveillance of food in storage at the dining facility. The following suggestions should be used as a guide to control the quality of food items stored at the dining facility:

a. NONPERISHABLES. Dry stores such as cereals or sugar should be inspected for signs of having been exposed to greasy substances or excessive moisture. Canned goods should be visually inspected prior to storage. If the shipping containers of canned items are crushed or torn, the cans should be checked for punctures or excessive rust. Nonperishables should be stored in a clean, well-ventilated store room. Bulk flour, sugar, and coffee should be stored in 24-or 32-gallon cans. Care should be taken to insure that the cans are clean and dry. Stocks should be allowed to run out, and cans should be washed periodically. When available, plastic containers may be used. The same care should be taken to insure that they are clean, dry, and airtight.

b. FRESH FRUITS AND VEGETABLES. The most commonly used fresh fruits and vegetables have a tremendously wide range of staying power. Rapid chilling and improved methods of handling leafy, stalk, pod, and some root vegetables and fruits help to insure that they will be in an acceptable condition when they reach the dining facility. All vegetables and fruits should be placed in controlled atmosphere storage. Because of the possible heavy loss if fruits and vegetables are improperly stored and refrigerated or if they are held too long, all shipments of these foods should be identified in some manner by the date of arrival.

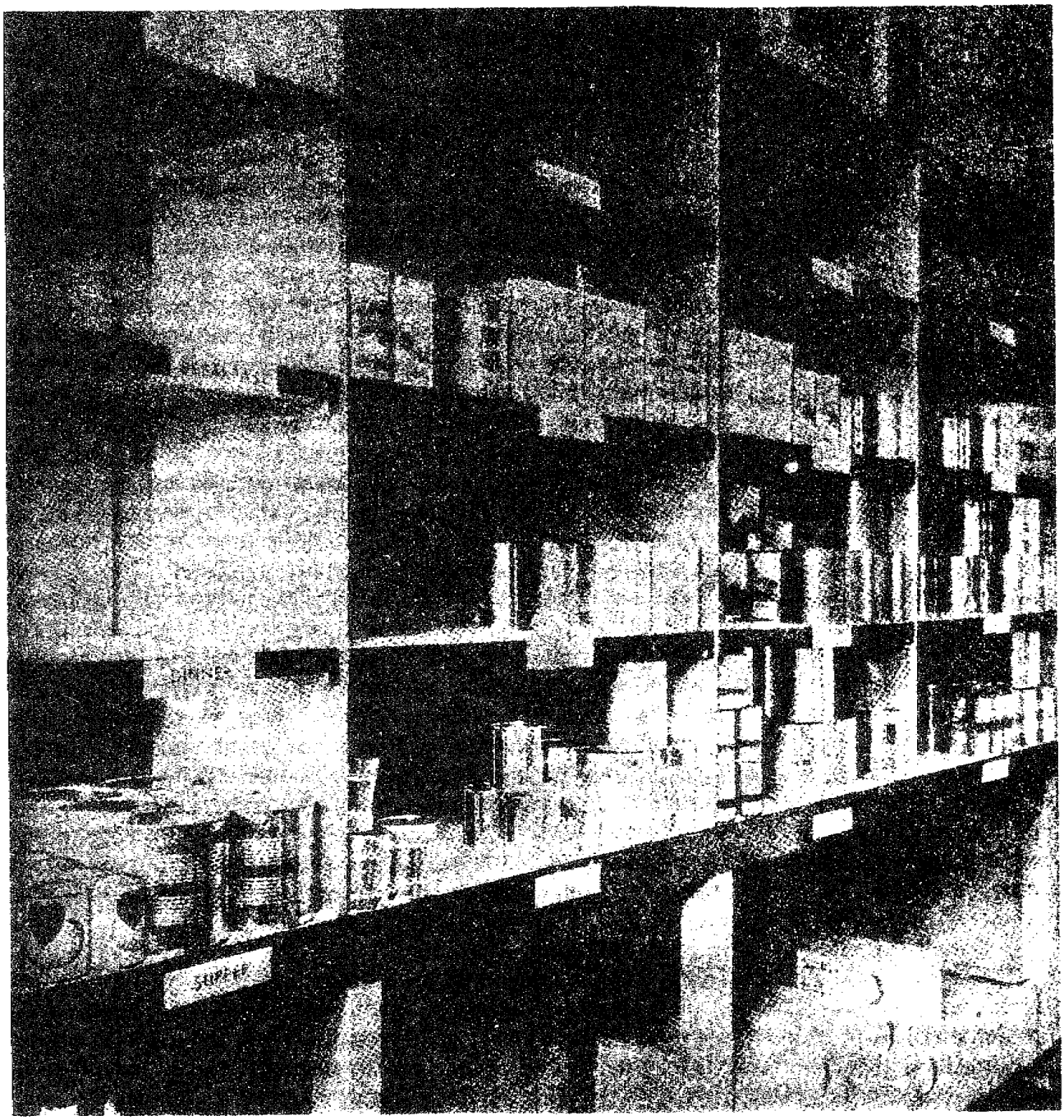


Figure 12. Storage of nonperishable subsistence.

c. FROZEN FRUITS AND VEGETABLES. Frozen fruits and vegetables should, be kept in solid form at low temperature (0° to -10° F.) until preparation time. Thawed fruits or vegetables should never be refrozen.

d. MEATS. Usually meats are delivered to the dining facility in a frozen state. Freezing protects the natural flavor, texture, color, palatability, and nutritional value of meat. Food service sergeants must insure that frozen meats are not stored at temperatures above 0° F. A minimum of 24 hours should be allowed for thawing meats in a refrigerator after they have been removed from the deep-freeze unit. Frozen products should never be thawed in water or by any form of heat. Hastening the process of thawing seriously affects the quality of frozen meats. Once thawed, meat must not be refrozen. Care should be taken to protect meats from freezer burn. If freezer burn should occur, the affected portion should be cut off before the meat is cooked, because it could alter the taste. When a central meat-processing plant is available or when meat is procured locally, meat that is not frozen may be issued to the dining facility. This meat should be stored at about 32° F. with relative humidity of 85 to 90 percent. Fresh meats should be stored away from other foods, because meats may acquire foreign flavors from fresh fruits, vegetables, and other items stored in the same refrigerator. Light-cured meats and tenderized hams are wrapped and stored under refrigeration. Full-cured hams may be stored in a cool room. Canned meats are stored in accordance with the directions on the container. The quality of canned meats cannot be judged until the item is opened. Odor, flavor, and appearance are determinants of whether the item is fit for human consumption.

e. POULTRY. The deterioration of dressed and ready-to-cook poultry is rapid unless the poultry is handled carefully and stored under properly controlled conditions. This poultry should be kept not more than 2 or 3 days in a refrigerator of 35° F. or less. Frozen poultry should be stored at 0° F. or below and cooked soon after it has thawed. Freezer burns may develop if poultry has been poorly packaged or if it has been stored at too high a temperature for too long a time. Excessive burning causes the skin to become dry and discolored and the meat to develop a strong flavor. Sometimes when frozen broilers or fryers are cooked, the heat of cooking causes the bone to darken, but does not alter the quality of the meat. Freeze-dried poultry may be stored at room temperature until it is reconstituted.

f. SEAFOOD. Usually the dining facility is issued frozen fish and shellfish or canned items. Frozen seafood should be kept frozen until time for cooking. Thawing at refrigerator temperature (36° to 40° F.) is recommended. Once frozen seafood is thawed, it should not be refrozen. If fresh fish is to be stored, a separate refrigerator unit is required. Characteristics of fresh fish in satisfactory condition are: freedom from objectionable odor; eyes--bright, clear, and full; flesh--firm, elastic, and not separating from the bones; gills--reddish pink with no slime or odor; and scales--bright-colored, glossy, and adhering to the skin.

g. EGGS. Eggs are highly perishable, and varied handling and storage methods produce wide changes and different degrees of deterioration. Among the physical changes that occur as deterioration advances are loss of viscosity by the thick layer of white, passage of water from the white to the yolk with an increase in size and fluidity of the yolk, tendency of the yolk to break when the shell is opened, increase in size of the air space, and absorption of odors. Among the chemical changes are loss of carbon

dioxide, loss of water, change in the hydrolysis of protein, increase of ammonia in the yolk, and increase in water-soluble phosphorus. The recommended temperature for storage of fresh eggs in the dining facility is 35° F. with a relative humidity of 88 to 92 percent. The following factors are important in the quality control of eggs during storage:

(1) Eggs to be used should be removed from the refrigerator 1 hour prior to use as this allows eggs to temper.

(2) Eggs should be clean and sound, and the cases, flats, and cushions in which they are stored should be odorless and in good condition.

(3) Eggs should not be stored near foods that give off strong odors.

(4) If the relative humidity of the rooms in which eggs are left is too low, excessive shrinkage of the white results.

(5) If the relative humidity of the rooms in which eggs are stored is too high, the eggs will mold.

(6) Frozen eggs should be held at 0° F. or below.

(7) Egg solids should be stored in a cool dry place but not necessarily in refrigerated storage. If egg solids are stored for long periods of time or if the temperature is too high, a mushy texture is produced when they are reconstituted and there is an off flavor due to fat deterioration.

h. MILK AND OTHER DAIRY PRODUCTS. Storage is an important factor in the acceptability of all dairy products. Clean refrigerated storage space, covered containers, and proper temperature control are necessary to control the quality of dairy products. If cheese becomes frozen, the taste becomes flat and the texture dry and crumbly. However, if cheese should accidentally be subjected to abnormally low temperature, it may still be used in grated form with spaghetti or similar foods. Mild cheeses, such as American and cottage, are the only types that may safely be stored near eggs. Butter absorbs odor readily and should be stored away from strong-odored foods such as cheese, smoked meats, and many fruits. It becomes rancid when exposed very long to air. Butter should always be carefully wrapped or closely covered. Listed below are temperatures at which dairy products should be stored in order to retain their quality.

(1) Fresh milk and cream, 32° to 35° F.

(2) Dry milk solids, in a cool (40° to 90° F.) storeroom in unopened packages or in tightly covered metal containers.

(3) Ice cream, 0° to -10° F.

(4) Butter and margarine, 32° to 35° F.

(5) Cheddar cheese, 32° to 35° F.

i. FATS AND OILS. Deterioration of cooking fats and oils is due primarily to oxidation, hydrolysis, and the absorption of odor. Careful storage is necessary to prevent them from becoming rancid. These food items should be stored in closed containers that exclude air and light and should be kept at low temperatures.

PROGRAMMED REVIEW

The questions in this programmed review give you a chance to see how well you have learned the material in this lesson. The questions are based on the key points covered in the lesson.

Read each item and indicate your choice by circling the appropriate letter. If you do not know, or are not sure, what the answer is, check the paragraph reference that is shown in parentheses right after the item; then go back and study or read once again all of the referenced material and write your answer.

After you have answered all of the items, check your answers with the Solution Sheet at the end of this lesson. If you did not give the right answer to an item, erase it and write the correct solution in the space instead. Then, as a final check, go back and restudy the lesson reference once more to make sure that your answer is the right one.

REQUIREMENT. Exercises 1 through 23 are multiple choice. Each exercise has only one single-best answer. Indicate your choice by circling the appropriate letter.

A1. One objective of good food preparation is to (para 2)

a. cook the item thoroughly.

b. conserve the nutritive value of the food.

c. follow the standard recipe exactly.

d. change the shape and texture of the item.

A2. Progressive cookery means cooking (para 4)

a. the entire meal without any breaks or work stoppages.

b. the entire amount of a given food at a given interval.

c. a food item in small batches at proper intervals.

d. vegetables to be ready when the serving line is setup.

A3. The use of Armed Forces Recipe Service is important because it (para 6)

a. contains recipes for foods available for issue to a dining facility.

b. gives directions for combining ingredients.

c. contains recipes designed to yield 125 standard portions.

d. gives instructions for protecting perishable foods.

A4. Which one of the following should the food service sergeant require of the cooks in order to assure quality of the food preparation? (para 6b)

a. Cook vegetables longer than indicated in recipe if the cooks think necessary.

b. Learn definitions of terms and abbreviations used in the recipes.

c. Make substitutions in the recipes to satisfy food preferences of troops.

d. Select the newest cooking utensils available for cooking the food.

SITUATION: The following situation is applicable to exercises 5 through 9. The menu calls for country-fried chicken and you need to serve 135 persons. The recipe is given in figure 4, and instructions for recipe conversion are given in figure 6.

A5. How many pounds of flour are needed to dredge the chicken? (fig. 4 & 6)

a. 4 lbs 3/4 ozs.

b. 4 lbs 3 ozs.

c. 4 lbs 6 ozs.

d. 4 lbs 8 ozs.

A6. How many pounds of flour are needed to prepare the cold roux to make gravy? (fig 4 & 6)

a. 1 lb 0 oz.

b. 1 lb 5 1/2 ozs.

c. 1 lb. 8 1/2 oz.

d. 1 lb 8 3/4 oz.

A7. The instructions for preparing the chicken indicates that the chicken should be (para 6a, fig 4, step 3)

a. fried in deep-fat.

b. browned in the oven at 425° F.

c. browned in batches in melted fat.

d. dredged in seasoned flour, covered with water, and cooked in 375° F. oven.

A8. The standard recipe gives both weights and measures for which of the following items? (fig. 4)

a. Water.

b. Pepper.

c. Fresh milk.

d. Flour.

A9. After the chicken is prepared for cooking, how is it arranged in the proper utensil for cooking? (fig. 4)

a. It is overlapped in rows in two 18-x 24-inch roasting pans.

b. It is overlapped in rows in one 36-x 48-inch roasting pan.

c. It is placed in layers in 24-inch dutch ovens.

d. It is placed skin side up in two 18-x 26-inch sheet pans.

A10. Which one of the following is true for weighing and measuring ingredients?

a. Dry ingredients are measured in cup with headspace.

b. Dried eggs should be measured.

c. Most liquid ingredients are measured.

d. Small quantities of dry ingredients are usually weighed.

A11. How should onions, eggplant, and cauliflower be prepared for deep fat frying? (para 10c)

a. Cut into uniform size and breaded.

b. Breaded and browned quickly on the grill.

c. Steamed or boiled until tender and breaded.

d. Sautéed until tender and breaded.

A12. How much water is needed to cook all vegetables except the strongly flavored vegetables? (para 10e)

a. Enough to cover the vegetables to prevent oxidation.

b. Enough to allow extra to make stock for soup.

c. Enough to keep the cooking utensil from boiling dry.

d. Enough to cook the vegetables slowly to prevent loss of vitamins.

A13. Which one of the following would <u>NOT</u> be true concerning measures to be taken to control the quality of baked cakes? (para 10f(3)(a)(b))

a. Preheat oven about 10 minutes before using.

b. Follow baking instructions very closely.

c. Test cakes using the toothpick method.

d. Allow room between the pans in the oven for air to circulate.

A14. Which one of the following is NOT used to control the oxidation of food? (pare 11a)

a. Cover prepared fruits with sugar or syrup.

b. Store foods containing ascorbic acid at room temperature.

c. Prevent broccoli from being exposed to air.

d. Place tight covers on juice containers.

A15. Which one of the following is a result of cooking meat slowly at a temperature between 250° and 325° F? (para 12a)

a. Color is less attractive.

b. Nutritional value is decreased.

c. Serving portions are increased.

d. Serving portions are decreased.

A16. What happens to oils and fats when they are heated to a temperature near 400° F? (pare 12c)

a. Nutritive value decreases.

b. Nutritive value increases.

c. Oxidation occurs.

d. Rancidity sets in.

A17. Which one of the following is true when meat is cooked at a high temperature? (para 12a & c)

a. The amount of liquid to be used for gravy is reduced.

b. The nutritive value of the protein is impaired.

c. The meat browns quickly and becomes a readily digestible product.

d. Less tender cuts of meat are made more tender.

A18 Which one of the following is NOT a result in the change of protein due to excess heating? (para 12c(4))

a. Poultry is tough and stringy.

b. Eggs are rubbery and tough.

c. Egg yolks are lighter in color.

d. Meat is less digestible.

A19. What effect does water have on vegetables containing B-complex vitamins? (para 13)

a. Water may cause the vitamins to dissolve.

b. Water may cause a strong odor.

c. Water causes the vegetables to be mushy.

d. Water causes the vegetables to turn yellow.

A20. When soft water is used to cook vegetables, what precaution must be taken? (para 13a(2))

a. Reduce alteration of color by covering the cooking pot.

b. Add extra water to preserve vitamins.

c. Reduce the cooking time.

d. Increase the cooking time.

A21. Which of the following is true of meat with freezer burns? (para 15d)

a. The meat may have an offensive odor.

b. The meat has been refrozen.

c. The meat is unfit for human consumption.

d. The burn should be cut off.

A22. Which one of the following is necessary to insure quality control of eggs in storage? (para 15g(3))

a. Remove eggs from storage about 30 minutes before use.

b. Store eggs away from foods that give off strong odors.

c. Always store egg solids in a refrigerator.

d. Store eggs in a room with relatively low humidity.

A23. Which one of the following causes butter to become rancid? (para 15h)

a. Overheating.

b. Storing near strong odored foods.

c. Exposing very long to air.

d. Storing in closely covered containers.

REQUIREMENT. Exercises 24 through 25 are matching exercise. Column I list characteristics of factors that contribute to the flavor of food. Column II lists the factors. Select the factor in column II that fits the characteristic in column I and indicate each answer by writing the column II letter below the column I number. Each factor in column II may be used once, more than once, or not at all.

Column I		Column II	
A24.	Intensifies, adds to, or enhances the flavor of food. (para 3b(2))	a.	Temperature.
		b.	Seasoning.
		c.	Degree of doneness .
A25.	May be determined by the "spring' test. (para 3b(5)	d.	Texture.

REQUIREMENT. Exercises 26 and 27 are matching exercises. Column I lists definitions of mixing methods used to control the quality of finished food products. Column II lists the methods. Select the method in column II that is defined in column I and indicate each answer by writing the column II letter below the column I number. Each method in column II may be used once, more than once, or not at all.

	Column I	Column II
A26.	Bringing the bottom mass constantly to the top to trap as much air as possible into the mixture. (para 9b)	a. Stirring. b. Folding. c. Beating. d. Blending.
A27.	Blend thoroughly without losing the air previously worked into the material. (para 9c)	

REQUIREMENT. Exercises 28 through 34 are true-false. Record each answer by writing a T or an F next to the exercise number.

A28. Accuracy in the use of the standard recipes insures that the dining facility serves each soldier food that is most acceptable to his individual taste. (para 6)

A29. A standard recipe is designed to yield 100 portions of the size indicated in the recipe. (para 6)

A30. Greater accuracy in the amount of ingredients in standard recipes is generally obtained by measuring dry ingredients and weighing liquid ingredients. (para 7)

A31. Meat, poultry, and fish that are to be deep-fat fried are breaded to prevent the surface of the food from burning. (para 10c(2))

A32. Vegetables cooked by steaming lose little of their minerals and vitamins. (para 10d) .

A33. Ascorbic acid in a fruit or vegetable is less susceptible to oxidation when citric acid is also present. (para 11 c)

A34. When necessary to feed more persons than the number for which the day's menu was planned, frozen meat may be thawed by placing it in cold water. (para 15d)

HAVE YOU COMPLETED ALL EXERCISES? DO YOU UNDERSTAND EVERYTHING COVERED? IF SO, TURN TO THE END OF THIS LESSON AND CHECK YOUR ANSWERS AGAINST THE SOLUTIONS.

APPENDIX

REFERENCES

1. ARMY REGULATIONS(AR).

30-1	The Army Food Service Program
30-11	Army Food Program
30-19	Army Commissary Store Operations
40-25	Nutritional Standards

2. TECHNICAL MANUALS(TM).

10-412	Armed Forces Recipe Service

3. FIELD MANUALS(FM).

10-23	Army Troop Feeding Operations
10-25	Preparation and Serving of Food in the Garrison Dining Facility

SOLUTION SHEET

PROGRAMMED REVIEW

A1. b
A2. c
A3. b
A4. b
A5. a
135 ÷ 10 = 1.35 (working factor)
3 x 1.35 = 4.05 (recipe)
.05 x 16 = .80 oz
.80 = 3/4 oz
4 lbs 3/4 oz -solution

A6. b
135 ÷ 10 = 1.35 (working factor)
1 x 1.35 = 1.35 (needed)
.35 x 16 = 5.60
.60 = 1/2 oz
1 lb 5 1/2 ozs -solution

A7. c
A8. d
A9. a
A10. c
A11. a
A12. c
A13. a
A14. b
A15. c
A16. a
A17. b
A18. c
A19. a
A20. c
A21. d
A22. b
A23. c
A24. b
A25. c
A26. c
A27. b
A28. F
A29. T
A30. F
A31. T
A32. T
A33. T
A34. F

LESSON 2 **Credit Hours: 4**

LESSON ASSIGNMENT

SUBJECT	Basic Food Preparation: Appetizers, Beverages, Breads and Sweet Doughs, Cereals and Paste Products, Cheese and Eggs, and Deserts.
STUDY ASSIGNMENT	Lesson Text.
SCOPE	Methods of preparing and serving appetizers, beverages, quick brads, rolls, cereals, paste products, cheese, eggs, and desserts; methods of controlling quality of items in preparation; and factor used in judging quality of finished products.
OBJECTIVES	As a result of successful completion of this assignment, you will be able to--

1. List the methods used to prepare:

    a. Appetizers.

    b. Beverages.

    c. Breeds and sweet doughs.

    d. Cereals and past products.

    e. Cheese and eggs

    f. Desserts

2. Convert a recipe for dough using the true percentages and the baker's percentages method.

3. List the methods for controlling the quality of the items covered in this lesson.

4. State the standards used in judging the quality of the items covered in this lemon.

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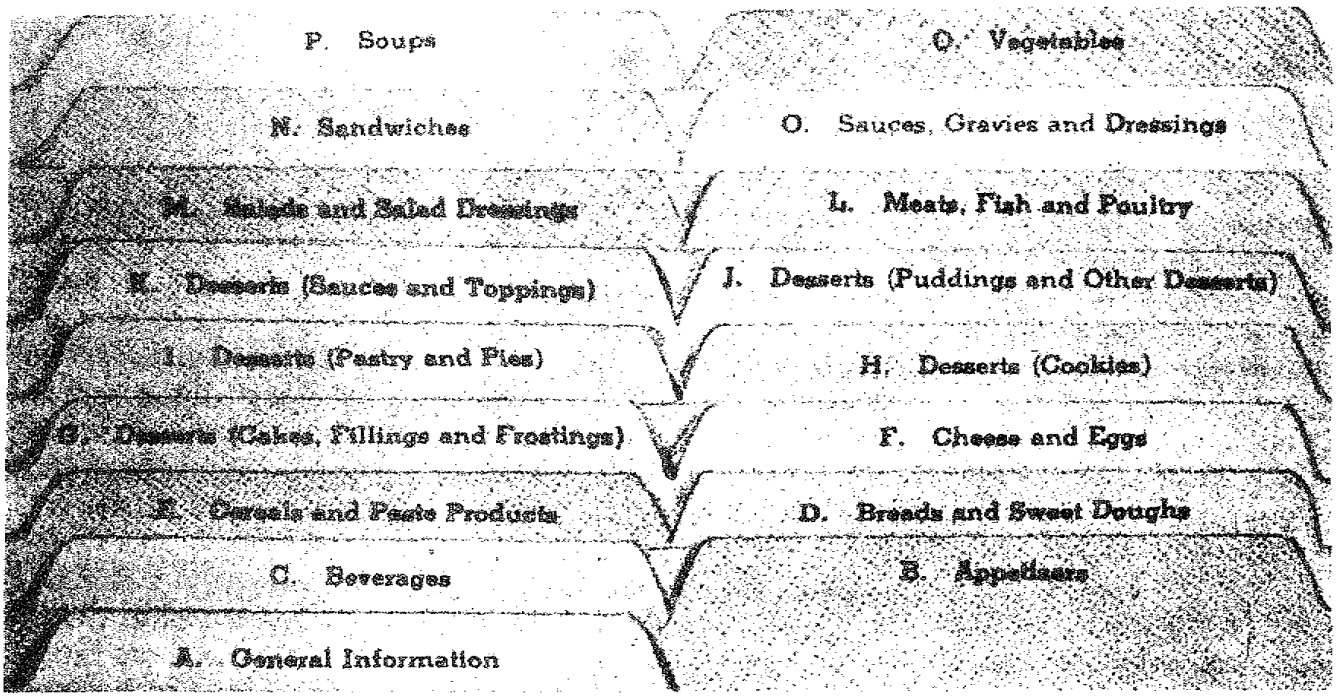
LESSON TEXT

SECTION I

INTRODUCTION

1. GENERAL. The food service sergeant is responsible for insuring that the food prepared in the dining facility is tasty and nutritious. To obtain the best results when preparing food, the following four points should be closely observed: use of ingredients of good quality, minimum lapse of time between preparation and service, proper cooking methods, and proper care of food after preparation. The food items are procured by the Army and issued to the dining facility. The main concern of the food service sergeant is to prepare and serve the food so as to insure that the troops receive their prescribed daily nutrition allowance. It is necessary for him to know the composition of foods and how they are affected by storage, preparation, and cooking and to establish procedures for good food preparation. Since nonresident students cannot actually prepare food, this text gives some guidelines for establishing criteria for effective food preparation.

2. BASIC KNOWLEDGE REQUIREMENTS. The first requisite of good cooking is an accurate knowledge of the items to be prepared. Dining facility personnel have specific instructions on which foods to prepare, the quantity needed, and the method of cooking. These instructions are furnished by the Master Menu, the Cooks' Worksheet, and the standard recipes in Armed Forces Recipe Service (TM 10-412). The index cards from TM 10-412 are shown in figure 1. The cooks must know the basic characteristics of the foods they are to prepare. For meats, the cut or quality of the meat is the factor that determines the length of time the item is to be cooked, the temperature at which it is to be cooked, and the method to be used (broiling, roasting, stewing, etc.). For vegetables, the age of the vegetables and the necessity of conserving the vitamins present are considered in determining the method of cooking. This text does not include the actual methods of cooking. However, each type of food prepared and served in a dining facility is discussed. Some suggestions for obtaining quality finished items end some factors for Judging the prepared items are included.



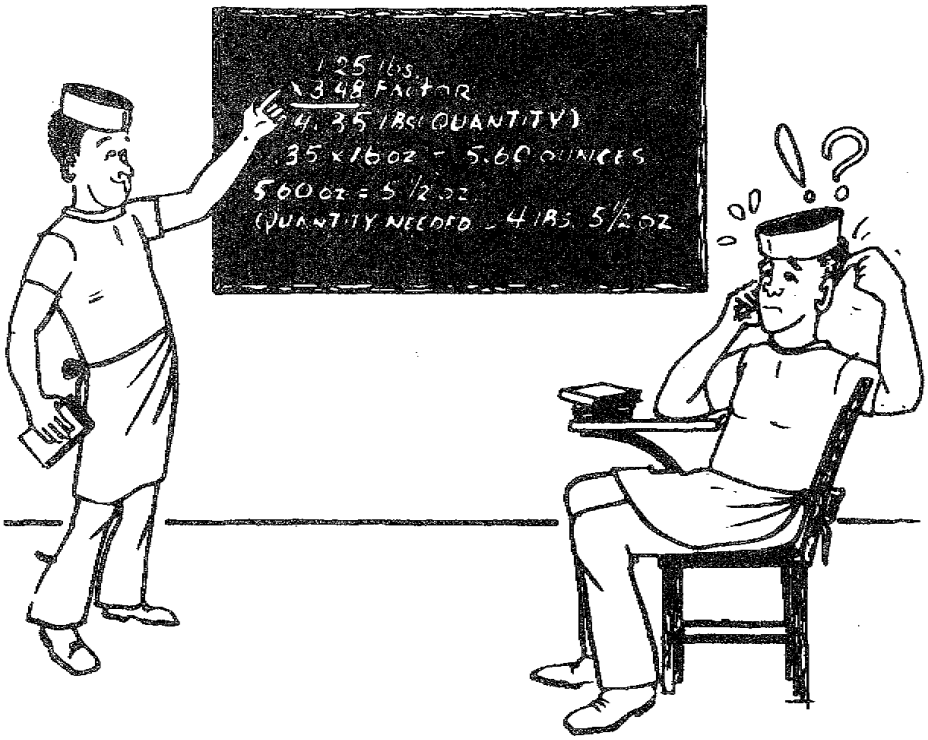


Figure 1. Index to Armed Forces Recipe Service (TM 10412).

SECTION II

APPETIZERS

3. GENERAL. Appetizers are used primarily to whet the appetite and to stimulate the flow of the gastric juice, not to satisfy hunger. To accomplish this function, appetizers must be attractively prepared, temptingly flavored, and properly served. Since many appetizers are tidbit morsels made up of any type of food that is pleasing to the taste there are not many standard recipes for them. Much is left to the talent, ingenuity, and taste of the dining facility personnel and to the food supply. The appetizers served in dining facilities are generally classed as cocktails, fruit juices, stuffed celery and soups. An appetizer may be served in many forms such as cocktails, canapés, hors d'oeuvres, as long as it performs its primary function. (Note. Soups, which are usually appetizers, are described in another lesson of this subcourse.)

4. COCKTAILS. Cocktails may be the juice of fruits or vegetables served in small, well-chilled glasses (A, fig. 2). The juice should be bright in appearance end tangy to the taste for the purpose of perking up the taste buds. Cocktails may also be fruit or seafood, usually served well chilled (B, fig. 2). They must have a fresh appearance and a uniform arrangement for attractiveness. The following are some helpful suggestions for preparing and serving cocktails:

a. Serve crackers, pretzel sticks, or heated potato chips as accompaniments to juice cocktails.

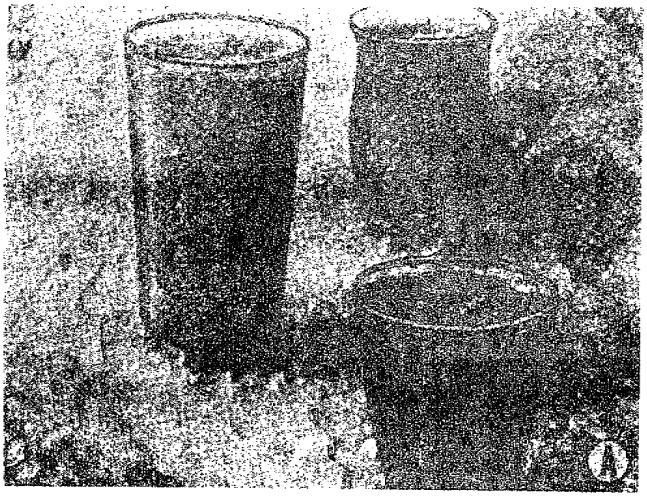
b. Arrange all ingredients in n attractive fashion, using natural food colors to create eye appeal.

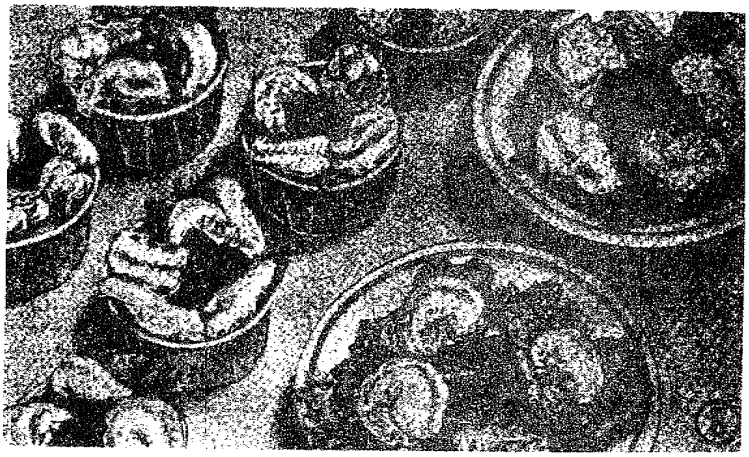
c. For melon bells, cut melon into complete balls; incomplete balls detract from the appearance.

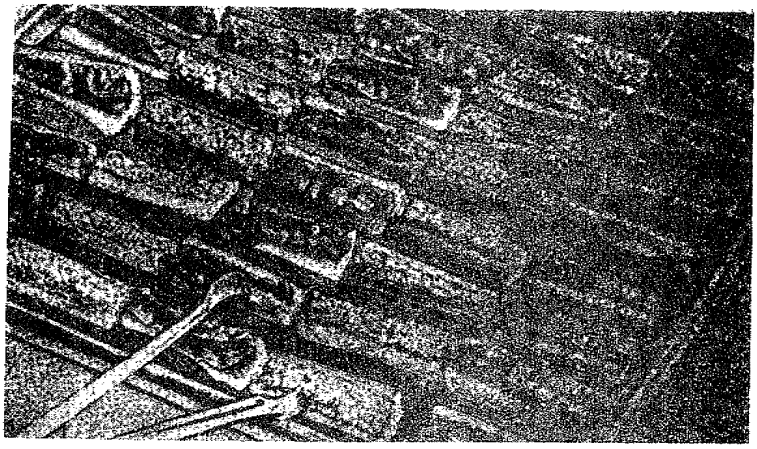
d. Garnish all cocktails with an item that will enhance the appearance and, if possible, improve the flavor.

e. Serve all cocktails well chilled.

5. CANAPÉS. Although canapés are not usually listed on the daily menu of the dining facility, the food service sergeant may train personnel to use imagination in preparing canapés from leftovers. The canapés may be served as snacks or as appetizers Canapés are thin pieces of bread or toast spread or topped with cheese, anchovies, or other appetizing foods. They are usually cut into various, small shapes and are highly decorated to make them eye appealing. Crackers are sometimes used as a base, although toasted bread may be more desirable because it does not absorb the moisture of the spread too quickly, and because it can be cut into more interesting shapes. Canapé spreads can be prepared from leftovers or from small amounts of food accumulated from other meals. Several different kinds of bread should be used to give a variety of taste and color. Canapés should be chilled thoroughly before they are served, unless they are to be served hot. Hot canapés are made in the same manner as the cold variety but are not garnished a highly. They are heated in the oven or under the broiler and served immediately. The following suggestions should help to obtain success:







A. Juice cocktails

B. Shrimp cocktails

C. Stuffed celery

Figure 2. Appetizers.

a. Mix all canapé spreads to a consistency that can be applied or spread with ease.

b. Keep all canapé spreads refrigerated until just before using them.

c. Select an extra sharp knife for trimming and cutting canapés.

d. Spread canapé base with a thin film of softened butter to prevent the canapés from becoming soggy.

e. Work systematically using an assembly-line technique--make one kind of canapé at a time.

f. Decorate canapés with an item that improves the appearance and enhances the taste.

g. Arrange items artistically on the serving tray, with the darker colors on the outside.

h. Cover the canapés with a damp cloth, and keep them in the refrigerator until serving time.

i. Replenish a tray when it is about two-thirds depleted. Partially depleted trays should be taken back to the kitchen for replenishing; they should never be replenished at the serving table.

j. Serve canapés and hors d'oeuvres on the same tray if desired.

k. Do not serve hot and cold canapés on the same tray.

6. HORS D'OEUVRES. Hors d'oeuvres are small portions of highly seasoned food. They are often called finger foods, since they are bite size to be eaten with the fingers or are secured on cocktail picks for easy handling. Varieties of meats, seafoods, and cheese may be shaped into bite-size croquettes or balls and fried, baked, or broiled and served as appetizers. Small cubes of cheese, sausage meat, and cocktail sausages, shrimp, and other foods may be secured on cocktail picks and served. Pickled vegetables, stuffed e.g., and stuffed vegetables such as celery (C, fig. 2), olives, and mushrooms are forms of hors d'oeuvres. Hors d'oeuvres may also be the cooks own creation. Listed below are some suggestions for use in preparing hors d'oeuvres:

a. Mix egg yolks in a ricer or in a china cap, for a smoother, creamier, deviled-egg mixture.

b. Place freshly stuffed deviled eggs in the refrigerator to set and become firm before covering them with a damp towel.

c. Cover a sheet pan with a towel before arranging pieces of celery to be stuffed. This procedure will keep the celery from slipping when the crevice is filled with cheese or other mixture.

d. Coat the palms of the hands lightly with salad oil to facilitate the rolling of meat bells and to prevent sticking.

7. CENTERPIECES. An appropriate centerpiece placed in the center of a tray and surrounded with colorful appetizers is always attractive. Be it an elaborate ice carving or a leafy head of cabbage, an attractive centerpiece always contributes to enjoyment of the meal. The following suggestions for centerpieces are limited to food items usually available in dining facilities:

a. Cut a cantaloupe, grapefruit, orange, apple, or other round fruit in half, and place it with the cut side down in the center of the tray. Stick hors d'oeuvres on cocktail picks into the fruit, and surround the fruit with an assortment of attractive appetizers.

b. Make roses from white potatoes, turnips, beets, and similar food items.

c. Spear cubes of cheese, ham, pickle, or other food items in a pineapple.

d. Shape an unsliced loaf of bread into an attractive form for a centerpiece, brown it in the oven or in deep fat, and use it as in a above.

8. GARNISHES. Garnishes for appetizers are usually devised from other foods and should be edible. The keynote to any food garnish should be naturalness and simplicity. The size of the garnish should be in proportion to the food item being decorated; for example, a tiny sprig of parsley no larger than the tip of the little finger is suitable for the top of a dainty canapé. Garnishes should be used in a way that expresses individual creativity. The following suggestions may be used in garnishing appetizers:

a. Garnishes are used to make the food more attractive, not to hide it.

b. A sprig of mint, a spot of whipped topping, or a sprinkling of candied fruit is an attractive addition to fruit cocktails.

c. Paprika sprinkled on deviled eggs, stuffed celery, and other hors d'oeuvres adds a touch of color.

d. Vegetable coloring may be added to butter to achieve an additional coloring for canapés. The coloring should harmonize or contrast with the main food item.

e. Watercress, parsley, and nutmeats may be sprinkled over cheese appetizers to add color and variety.

f. Garnishes for the serving tray may be made by slivering or cutting pickles into a fan shape, by cutting oranges or lemons into rings or wedges, and by cutting fresh apples into cubes, rolls, and rings and rolling them in paprika or finely chopped parsley.

g. As a general rule, fruits are garnished with fruits, vegetables with vegetables, and meats with meats. However, vegetables like parsley, lettuce, and celery are often used to garnish all three classes of foods.

SECTION III

BEVERAGES

9. GENERAL. A beverage is any liquid used to quench thirst. A hot drink on a cold day or a cold drink on a hot day can make an important contribution to the comfort and morale of the troops. Beverages such as coffee, tea, and carbonated drinks of low nutritive value, and those containing cocoa, milk, eggs, fruit, or fruit juices are of high nutritive value. Beverages may be served hot or iced, depending upon the season of the year, the meal being served, and the type of work performed by the troops. The essential factors to be taken into account in the preparation of beverages are freshness, blend and temperature of ingredients (including water); accuracy of measurements; care in preparation; time of preparation (just before serving for coffee and tee); cleanliness and adequacy of equipment; and selection of the other components of the meal.

10. COFFEE. The preparation of coffee demands as much detailed attention as does any other part of the meal. Well-prepared coffee that ideally complements a meal adds immeasurably to eating enjoyment. Coffee is made when hot water comes in contact with ground coffee and extracts certain soluble materials from it. The amount of time the water is in contact with the coffee grounds governs to some extent the flavor of the coffee. Mild-flavored coffee results from short-time contact of water and coffee and bitter or more astringent flavors, from long contact. However, coffee that tastes good to one person does not necessarily taste good to another. Three ingredients of coffee, caffeols, caffeine, and tannin, control the flavor and aroma, the stimulating effect, and the bitterness. Caffeols are water soluble, and when the temperature of the water rises, their flavor and aroma are transferred from the coffee to the water.

a. GENERAL PRINCIPLES OF COFFEE BREWING. General principles of coffee brewing are shown in figure 3.

b. ICED COFFEE PREPARATION. Iced coffee can be prepared either from instant coffee or from ground coffee brewed in an urn. The procedures and precautions for proper coffee brewing should be observed when preparing iced coffee, but another factor, dilution, must be considered. The original brew must be twice as strong to allow for melting of the ice.

c. SUGGESTIONS FOR CONTROL OF QUALITY. Listed below are several suggestions which help to produce brewed coffee of standard quality. For instant coffee issued for use in a dining facility, the instructions on the package are used for preparation of the brew.

(1) Store roasted coffee in an airtight metal container because coffee loses its flavor and aroma rapidly when exposed to air, and because it absorbs odors which lower its quality.

(2) Use older stocks first. Within three days after opening, vacuum coffee has lost much of its flavor.

GUIDELINES FOR BREWING COFFEE C-G. BEVERAGES No. 1

1. Measure or weigh quantities of both water and coffee carefully. Prepare only in amounts necessary to maintain uninterrupted service. Coffee held 1 hour or longer deteriorates in flavor and loses its aroma.
2. Use the proportion of 1 pound of coffee to 2¾ gallons of water for a brew of standard strength. Two and one-half pounds of coffee and 6¾ gallons of freshly drawn boiling water will yield approximately 100 (8 ounce) servings.
3. Ingredients for a good coffee brew are fresh coffee and freshly boiling water. Water that has been boiled a long time will have a flat taste which will be imparted to the brew.
4. For an ideal brew, boiling water should pass through coffee within 4 to 6 minutes.
5. Keep equipment clean. Clean immediately after each use to prevent the development of rancid flavors.
6. Urns and urn baskets should be washed with hot water and special urn cleaner or soda. (Do not use soap or soap powder). Rinse with clear water. When not in use, leave 1 or 2 gallons of clear water in urn. Drain before making coffee.
7. A new urn bag should be thoroughly rinsed in hot water before using. After using, urn bags should be thoroughly rinsed in clear, hot water; keep submerged in cold water until next use.
8. Faucets and glass gauges should be cleaned often with gauge brushes, hot water, and urn cleaner or soda. Rinse with clear water. Caps on faucets and gauges are removable to permit cleaning.

Figure 3. General principles of coffee brewing from Armed Forces Recipe Service.

(3) Realize that coffee brews are definitely affected by the type of water used. Extremely soft or hard and very alkaline waters do not produce good coffee yields. Excess chlorine, sulfur, ammonia, and other chemicals in water produce off-flavored coffee.

(4) Do not store routed coffee in wooden containers because the coffee may absorb odors from the wood, and the containers cannot be properly cleaned and dried.

(5) Do not brew coffee in an iron container, because the chemical reaction between the tannic acid and the container will produce a brew that is unfit to drink.

(6) Brew coffee 15-20 minutes prior to serving.

(7) Serving temperatures should never exceed 180° F.--185° F.

(8) Do not allow brewed coffee to boil.

(9) Do not add a new brew to a leftover brew.

d. JUDGING THE FINISHED PRODUCT. Fresh coffee should have a pleasant taste and should not have a bitter or acid flavor. It should smell fragrant, mellow, and rich, not rancid or oily. The color of a rich brew should be rich, dark brown, not black. Clarity of the brew is more related to coffee strength than to color. Coffee should be bright, clear, and sparkling. To test the clarity of coffee, lower a teaspoon into a full cup of coffee, and observe the spoon through the coffee; there should be no cloudiness, dullness, or muddiness. The constituents of brewed coffee which are of chief importance in judging it are flavor substances,

Table 1. Characteristics of coffee constituents

Coffee Substance	Desirable or Undesirable	Characteristics	Optimum Temperature
Flavor Caffeols	Desirable	1. Volatile, carried off by steam. 2. Destroyed by too high a temperature. 3. Destroyed by prolonged heating even at low temperature.	Below boiling 185°-203° F.
Stimulating Caffeine	Desirable	1. Nearly all dissolved at 203° F. 2. Water hot enough to raise percent of extraction has adverse effect on the other constituents.	Below boiling 185°-203° F.
Bitter Tannin	Undesirable	1. Easily extracted by boiling temperature or prolonged heating.	Below boiling.

stimulating substances, and bitter substances. Table 1 shows the characteristics of these constituents and how they are affected by improper temperatures.

11. TEA. Like coffee, tea has three ingredients that control the flavor and aroma, the stimulating effect, and the bitterness. These ingredients are theols, theine, and tannin. Theols are water soluble, and their flavor and aroma are transferred from the tea to the water. Tea brewing is known as an "infusion," a process whereby boiling water poured over tea leaves causes a chemical reaction that releases theine (or caffeine), a vegetable tannin, and tiny amounts of oils, color, and other substances from the leaves. The basic idea of good brewing is to capture the flavor essence of tea obtained by this reaction at the proper time. Two forms of black tea are used, bulk tea and teabags. In addition powdered instant tea has special uses in the military services.

a. METHODS OF TEA BREWING. Standard recipes from Armed Forces Recipe Service for preparing hot tea and iced tea are shown in figure 4. The most frequently used method of brewing tea in the dining facility is the use of individual teabags. The teabags are placed conveniently near urns of water heated to 175° to 185° F.), and each person brews his tea in a cup. When powdered instant tea is issued for use as iced tea in summer menus, the tea is added to cold water, not water to the tea. The mixture is stirred until the tea is dissolved and is then poured over cracked ice.

b. SUGGESTIONS FOR CONTROL OF QUALITY. The following suggestions should help to control the quality of brewed tea:

(1) Store tea leaves or bags in airtight metal containers to avoid loss of flavor and aroma.

(2) Determine the hardness and softness of the water available, and adjust the brewing time accordingly. Very soft water hastens the extraction of the flavor-color components from tea. Hard alkaline water slows down the rate of extraction and produces cloudiness and darkness.

(3) Schedule the preparation of hot tea so that not more than 15 minutes elapse between preparation and serving. Prepare in small batches. Maintain a temperature between 175° and 180° F. throughout the serving period. To prevent a bitter taste, tea must never be boiled.

(4) Do not warm over tea, and do not mix a new brew with a leftover brew.

(5) Store leftover brewed tea to be used as iced tea, provided that ice has not been added to chill it. If the tea is cooled too rapidly, clouding will occur. This is particularly true of an overbrewed tea containing a high amount of tannin. By either heating the tea slightly or adding hot water will clear cloudy tea instantly.

(6) To prevent cloudiness when diluting strong tea, pour the tea into the water, not water into the tea.

c. JUDGING THE FINISHED PRODUCT. A good cup of tea has a fragrant, fruity aroma and flavor. It is clear and is free of oiliness and leaf silt. Unlike coffee, tea has little or no body.

HOT TEA

C. BEVERAGES No. 12

YIELD: 100 Portions (6¼ Gallons)				EACH PORTION: 8 Ounces
INGREDIENTS	WEIGHTS	MEASURES		METHOD
Tea, black, loose	8 oz	3 cups		1. Place tea in a cloth bag large enough to hold three times the amount. 2. Tie top of bag with cord long enough to facilitate removal; tie cord to handle of urn or kettle. 3. Place tea bag in urn or kettle.
Water, briskly boiling		6½ gal		4. Pour water over tea bag. Cover. Allow to steep 3 to 5 minutes. Do not agitate or stir. 5. Remove tea bag. 6. Cover; keep hot, but do not boil.

NOTE: 1. If loose tea, not enclosed in a cloth bag, is placed in the urn or kettle, strain tea after it has steeped 5 minutes.
2. Tea must be made just before serving.
3. Tea must never be boiled as this imparts a bitter flavor.
4. Schedule preparation of tea so that not more than 15 minutes will elapse between its preparation and service; hold finished tea at temperatures 175°F. to 185° F.

ICED TEA
(Instant)

C. BEVERAGES No. 13

YIELD: 8 Gallons				EACH PORTION: See Note 2
INGREDIENTS	WEIGHTS	MEASURES		METHOD
Tea, instant	3 oz	4¾ oz pkg		1. Add tea to water. Stir until dissolved.
Water, cold		8 gal		2. Serve over crushed ice.

NOTE: 1. YIELD: 8 gal strong tea.
2. For each 8 oz glass, use about 5 oz strong tea. Fill with crushed ice. Serve 2-8 oz glasses per portion.

VARIATIONS

1. ICED TEA (INSTANT, FOR DISPENSER): Omit Step 1. Place 6¾ oz jr Tea, Instant, on dispenser. Follow manufacturer's directions for preparation and dispensing of tea. YIELD: 9 gal strong tea. Serve over crushed ice.
2. ICED TEA (INSTANT, WITH LEMON AND SUGAR, FOR DISPENSER): Omit Step 1. Place 24 oz jr Tea, Instant, with Lemon and Sugar, on dispenser. Follow manufacturer's directions for preparation and dispensing of tea. YIELD: 1½ gal strong tea. Serve over crushed ice.
3. ICED TEA (TEA, BLACK LOOSE): Omit Step 1. Place 12¾ oz (6¾ cups) black, loose tea in a cloth bag large enough to hold 3 times the amount. Tie top of bag. Bring 1½ gal water to a boil; turn off heat; add tea bag. Allow to steep 3 to 5 minutes. Remove bag. Pour hot tea into 6½ gal cold water. See Notes 1 and 2.

Figure 4. Standard recipes for hot tea and Iced tea.

12. COCOA. Hot cocoa (hot chocolate) or cold cocoa (chocolate milk) is frequently served in place of, or in addition to, coffee or tea at one of the three daily meals. Milk, as the major ingredient of these beverages, contributes to the nutrition of the meal by supplying liberal quantities of minerals, vitamins, protein, and liquids.

a. PRINCIPLES OF COCOA PREPARATION. The standard recipe from Armed Forces Recipe Service for preparing cocoa is shown in figure 5. There are several cooking principles in cocoa preparation that must be learned to produce a consistently good standard product.

HOT COCOA C. BEVERAGES No. 1

YIELD: 100 Portions (6¼ Gallons) **EACH PORTION: 8 Ounces**

INGREDIENTS	WEIGHTS	MEASURES		METHOD
Cocoa	1 lb	1 qt		1. Combine cocoa, salt, and sugar.
Salt		1½ tsp		
Sugar, granulated	3 lb 10 oz	2 qt		
Water, cold		1½ qt		2. Add water and mix. Heat to boiling point; reduce heat and simmer 5 minutes.
Milk, nonfat, dry	4 lb 8 oz	3¾ qt		3. Reconstitute milk; add to cocoa syrup, stirring constantly. Add vanilla; mix until well blended.
Water, warm		5¼ gal		4. Heat to just below boiling. DO NOT BOIL.
Vanilla (optional)		2 tbsp		5. Serve hot.

NOTE: 1. 5½ gal other types of milk may be substituted for water and nonfat dry milk in Steps 2 and 3. See Recipe Card A-9.
2. If desired, cocoa may be served with miniature marshmallows. 8 oz (4½ cups) will yield 4 to 5 marshmallows per serving of cocoa.
3. If 6 oz portions are desired, prepare ¾ of basic recipe.

VARIATIONS

1. CHOCOLATE MILK: Omit Steps 4 and 5. Chill before serving.
2. HOT WHIPPED COCOA: Omit Steps 1 through 4. Place 6 lb Cocoa Beverage Powder in dispenser container. Follow dispenser manufacturer's directions for preparation and dispensing of cocoa. EACH PORTION: 6 ounces.

Figure 5. Standard recipe for cocoa.

(1) The starch in the cocoa must be cooked to make it soluble.

(2) When milk is heated for more than a few minutes, even at temperatures below the boiling point, a thin skim forms over the surface. If the container is kept covered during the heating process, the amount of skim is reduced.

(3) Beating the milk-cocoa mixture produces a foam that serves as a surface coating.

b. JUDGING THE FINISHED PRODUCT. A good cup of hot cocoa should have a pleasing appearance and taste. The color should be light, rich-brown, not gray or muddy, and the texture should be smooth with no skim, foam, or sediment. The flavor should be delicately sweet, not scorched.

13. FRUIT DRINKS. Tasty, cold fruit juices may be served as a valuable addition to a breakfast meal, or they may be served as appetizers. Fruit drinks such as lemonade, orangeade, and mixed fruit punch stimulate and boost energy and provide a cooling effect for a hot summer day.

a. METHODS OF PREPARATION. Cold fruit juices and fruit drinks requiring sugar are usually prepared as outlined below.

(1) CANNED FRUIT JUICES. Iced juices should be prepared far enough in advance so that they are thoroughly chilled before serving. To help the palatability of these juices, shake the containers before opening them to redistribute the fruit solids tending to settle in the bottom of the container, and serve the juices as soon after the containers are opened as possible to insure that the solid particles stay in suspension.

(2) FROZEN, CONCENTRATED FRUIT JUICES. To prepare frozen, concentrated juices, thaw them to a slush stage in a refrigerator, empty the contents into a pitcher, add the specified amount of water, mix vigorously, and chill and serve. DO NOT ADD ICE.

(3) INSTANT FRUIT JUICES. In some situations instant fruit juices may be issued to dining facilities. These products, which are highly palatable and easy to use, should be prepared according to the instructions on the containers.

(4) LEMONADE, FRUIT PUNCHES, AND OTHER SWEETENED ICED DRINKS. The standard recipes show the ingredients and the methods for making fruit-juice beverages requiring sugar, such as orangeade, lemonade, and fruit punches. It is important to note that in most instances a simple sweet syrup, instead of granulated sugar, is used as a sweetener. The fruit mixture is refrigerated until time to be served, and then crushed ice is added.

b. SUGGESTIONS FOR CONTROL OF QUALITY. The following suggestions should help to control the quality of fruit juices and fruit drinks:

(1) Store unused portions of opened canned fruit juices in a satisfactory storage container with a tight-fitting cover. Acid fruit juices left in the can tend to develop a "tinny" taste. Also, fruit juices absorb refrigerator odors and flavors.

(2) Store frozen fruit juices at 0° F., or lower, to retain maximum quality.

(3) Taste sweetened fruit drinks before serving them to insure that the beverage is not sour. Sharp, acid fruit beverages are preferable because acidity leaves a fresh taste, and sour beverages are not palatable.

a. JUDGING THE QUALITY. Fruit beverages must have a good flavor with just the right amount of sweetness. Iced beverages must not be diluted by melting ice.

SECTION IV

YEAST-RAISED DOUGHS

14. GENERAL. "Bread" is an accepted term used for centuries to describe a mixture of flour, sugar, shortening, salt, and liquid that is made into dough. When yeast is added, the dough is raised by the action of the added ingredient, and the dough mass that results is leavened, or fermented, and baked at a determined stag. This same combination of ingredients is used for making bread rolls. Sweet dough products including sweet rolls, coffee cakes, and doughnuts differ from loaf bread and bread rolls principally in the proportion of ingredients used. The dough formula for these items is richer than that used for bread. Also. more sugar is used, and eggs and spices, ingredients not usually contained in bread, are incorporated.

15. BREAD ROLLS. Yeast dough that is intended mainly for use as rolls is usually softer than dough that is made into loaves. Also, a richer formula is used for rolls, and less mixing is required.

a. METHOD OF PREPARATION. The standard hot-roll recipe (fig. 6) gives the quantity of ingredients for 100 servings and the methods of preparation. Figure 7, an excerpt from Armed Forces Recipe Service, is a guide for hot-roll makeup.

b. RECIPE CONVERSION. When more or lest than 100 servings are needed, either the true percentages method or the baker's percentages method may be used for converting the recipe. The standard recipe for sweet dough is shown in figure 8. The first column of the recipe gives the percentage of each ingredient in relation to the total quantity of the entire recipe. This percentage, known as true percentage, is based on the total weight of all the recipe ingredients, the sum of which represents 100 percent. The baker's percentages method is based on flour being 100 percent of the formula. Figure 9 gives instructions for recipe conversion by the true percentages method, and figure 10, by the baker's percentages method. In order to use the baker's percentages method, it is necessary to use the formula based on 100 percent flour. Table 2 shows baker's percentages for ingredients of rolls, sweet dough, and other yeast-raised dough products.

c. SUGGESTIONS FOR CONTROL OF QUALITY. A guide for preparation of yeast breads, from Armed Forces Recipe Service is shown in figure 11. For lighter more moist rolls, mix the ingredients fully, and allow the dough to develop to full volume. The food service sergeant should remind dining facility personnel that warm dough ferments and proofs more rapidly. During hot weather, the dough should be slightly cooler.

d. JUDGING THE QUALITY. Changes take place within the dough at a rate determined by the ingredients in the formula, the temperature of the dough, and the conditions surrounding the dough. Quality is greatly determined by the speed, completeness, and uniformity of these changes. Table 3, an excerpt from Armed Forces Recipe Service, shows the characteristics of good quality breads. Table 4 lists the causes of poor quality breeds.

YIELD: 100 Portions (8 Pans) EACH PORTION: 2 Rolls

PAN SIZE: 18 by 26-inch Sheet Pan TEMPERATURE: 400° F. Oven

PER CENT	INGREDIENTS	WEIGHTS	MEASURES		METHOD
.94	Yeast, active, dry	3½ oz	⅓ cup		1. Sprinkle yeast on top of water. DO NOT USE TEMPERATURES OVER 110° F. Mix well. Let stand 5 minutes; stir.
7.50	Water, warm (105° F. to 110° F.)	1 lb 12 oz.	3½ cups		
23.60	Water, cold	5 lb 8 oz	2¾ qt		2. Dissolve sugar and salt in water in mixer bowl. Add yeast solution.
6.43	Sugar, granulated	1 lb 8 oz	3⅓ cups		
.94	Salt	3½ oz	5 tbsp		
51.47	Flour, wheat, bread, sifted	12 lb	3 gal		3. Combine flour and milk; add to liquid solution. Use dough hook; mix 1 minute or until flour is incorporated into liquid.
2.15	Milk, nonfat, dry	8 oz	1½ cups		
6.97	Shortening, softened	1 lb 10 oz	3¾ cups		4. Add shortening and continue mixing at medium speed 10 minutes or until dough is smooth and elastic. Dough temperature should range between 78° F. to 82° F.
100.00		23 lb 5 oz			

METHOD FOR HANDLING MIXED DOUGH

5. FERMENT: Set in warm place (80° F.) 1½ hours or until double in bulk.
6. PUNCH: Divide dough into 3 to 4-lb pieces; round up; let rest for 10 to 20 minutes.
7. Roll each piece into a long rope of uniform diameter. Cut rope into pieces about 1 inch thick, weighing 1½ to 2 oz each.
8. MAKE UP: As desired. Place rolls on greased pans and brush with Butter Wash. (See Recipe Card D-53.)
9. PROOF: At 90° F. until double in size.
10. BAKE: 15 to 20 minutes or until golden brown. Brush with Butter Wash immediately after baking.

D. BREADS AND SWEET DOUGHS No. 333

HOT ROLLS

NOTE: In Step 8, see Guide for Hot Roll Make-Up (Recipe Card D-G-6).

VARIATIONS

1. HOT ROLLS (BROWN AND SERVE): Prepare rolls as outlined in basic recipe. Proof about 30 minutes (¾ proof) and bake at 300° F. for 12 to 15 minutes, or until the first sign of color. Partially baked rolls may be left on sheet pans and wrapped in moisture vapor proof paper (plastic wrap or aluminum foil) and held in refrigerator at 40° F. up to 2 days or in freezer up to 5 days. Finish baking at 400° F. about 12 minutes or until golden brown.
2. HOT ROLLS (ROLL MIX): Use 13 lb 8 oz (3-No. 10 cn) canned Roll Mix and 4½ oz (¾ cup) active dry yeast. Prepare dough according to instructions on container.

CH-4

Figure 6. Standard recipe for hot rolls from Armed Forces Recipe Service.

GUIDE FOR HOT ROLL MAKE-UP

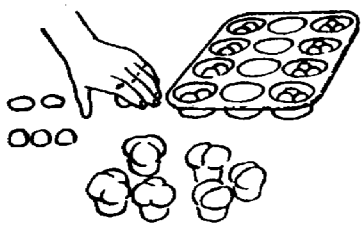


Figure 1

1. Clover Leaf or Twin Rolls

1. Follow Steps 1 through 7 of basic recipe.
2. Divide each 1½ oz piece of dough into thirds for clover leaf rolls or in halves for twin rolls.
3. Shape into balls by rolling with a circular motion on the work table.
4. Place in greased muffin pans, allowing 3 balls in each cup for clover leaf rolls or 2 balls for twin rolls; brush with Butter Wash.
5. Follow Steps 9 and 10 of basic recipe.

2. Frankfurter Rolls

1. Follow Steps 1 through 7 of basic recipe.
2. Roll the 1½ or 2 oz pieces of dough into oblong rolls, 3 inches long for dinner rolls, and 5 to 6 inches long for frankfurter rolls.
3. Place on greased sheet pans in rows 5 by 10 for dinner rolls, and 4 by 10 for frankfurter rolls. Brush with Butter Wash (Recipe Card D-53) or Egg Wash.
4. Follow Steps 9 and 10 of basic recipe.

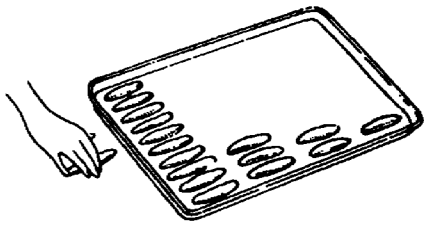


Figure 2

3. Hamburger or Sandwich Buns

1. Follow Steps 1 through 7 of basic recipe.
2. Shape 1½ to 2 oz pieces of dough into balls by rolling with a circular motion on the work table.
3. Place on greased sheet pans in rows 4 by 6.
4. When half-proofed, flatten with the hand or small can to about ¼-inch thickness; brush with Butter Wash.
5. Follow Steps 9 and 10 of basic recipe.

Figure 3

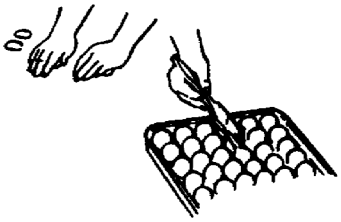


Figure 4

4. Pan or Cluster Rolls

1. Follow Steps 1 through 7 of basic recipe.
2. Shape 1½ oz pieces of dough into balls by rolling with a circular motion on the work table.
3. Place on greased sheet pans in rows 6 by 9. Brush with Butter Wash (Recipe Card D-53) or Egg Wash.
4. Follow Steps 9 and 10 of basic recipe.

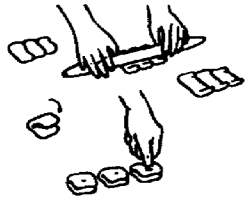


Figure 5

5. Parker House Rolls

1. Follow Steps 1 through 7 of basic recipe.
2. Shape 1½ oz pieces of dough into balls by rolling with a circular motion on the work table. (fig. 4).
3. Let rest 5 to 10 minutes; cover with a clean damp cloth.
4. Press the center of each ball with a small rolling pin.
5. Brush with Butter Wash (Recipe Card D-53) and fold in half. Press edges together with thumb or palm of hand.
6. Place on greased sheet pan in rows 6 by 9. Brush with Butter Wash.
7. Follow Steps 9 and 10 of basic recipe.

6. Poppy Seed or Sesame Seed Rolls

1. Shape rolls as desired.
2. Brush top of rolls lightly with water, dip top of rolls in poppy seeds or sesame seeds before placing on greased sheet pans. The topping will adhere to the dough.
3. Use 4 oz (½ cup) of seeds per 100 portions.
4. Follow Steps 9 and 10 of basic recipe.

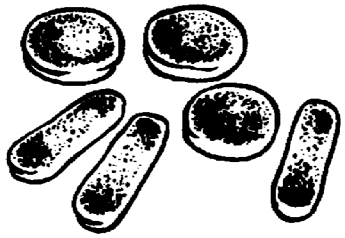


Figure 6

Figure 7. Guide for hot-roll makeup from Armed Forces Recipe Service.

SWEET DOUGH

YIELD: 100 Portions (4 to 6 Pans)					EACH PORTION: 2 Rolls
PAN SIZE: 18 by 26-inch Sheet Pan					TEMPERATURE: 400° F. Oven
PER CENT	INGREDIENTS	WEIGHTS	MEASURES		METHOD
2.52	Yeast, active, dry	8 oz	1½ cups		1. Sprinkle yeast on top of water. DO NOT USE TEMPERATURES OVER 110° F. Mix well. Let stand 5 minutes. Stir.
6.29	Water, warm (105° F. to 110° F.)	1 lb 8 oz	3 cups		
12.59	Water	2 lb 4 oz	4½ cups		2. Place ingredients in mixer bowl in order listed. Add yeast solution.
8.81	Sugar, granulated	1 lb 12 oz.	1 qt		
.95	Salt	3 oz	4½ tbsp		3. Use dough hook; mix at low speed for 1 minute or until all flour is incorporated into liquid. Continue mixing at medium speed 10 minutes or until dough is smooth and elastic. Dough temperature should range between 78° F. to 82° F.
8.18	Shortening, softened	1 lb 10 oz.	3¾ cups		
8.81	Eggs, whole, beaten	1 lb 12 oz.	3½ cups (18 eggs)		
50.35	Flour, wheat, bread, sifted	10 lb	2½ gal		
1.50	Milk, nonfat, dry	4¾ oz	1 cup		
109.00		19 lb 13¾ oz			

METHOD FOR HANDLING MIXED DOUGH

4. FERMENT: Set in warm place (80°F.) about 1½ hours or until double in bulk.
5. PUNCH: Divide dough into 4 pieces, 4 lb 12 oz each; shape into a rectangular piece. Let rest 10 to 20 minutes.
6. MAKE UP: As desired. Brush with specified wash.
7. PROOF: At 90° F. to 100° F. until double in size.
8. BAKE: 15 to 20 minutes or until golden brown.
9. Ice, if desired.

NOTE: 1. Water in Step 3 must be tempered to obtain a dough temperature of 78° F. to 82° F. (use warm water during cold weather and cold water during warm weather).
2. In Step 6, see Guide for Sweet Dough Make-Up (Recipe Card D–G–7).
3. If made up as Coffee Cake, bake at 375° F. for 25 to 30 minutes.
4. In Step 9, Flowing Icing (Recipe Card D–48), Vanilla or Rum Glaze (Recipe Card D–49) may be used.

VARIATION

1. SWEET DOUGH (SWEET DOUGH MIX): 15 lb or 3⅓-No. 10 cn Sweet Dough Mix and 5 oz (1 cup) active dry yeast may be used for ingredients. Proceed with Steps 5 through 9.

CH–4

Figure 8. Standard recipe for sweet dough from Armed Forces Recipe Service.

RECIPE CONVERSION

Most of the recipes for breads and sweet doughs have an additional column on the left side of the recipe card for true percentages. True percentages are based on the total weight of all the recipe ingredients, the sum of which adds up to 100 per cent. Another method of determining recipe or formula percentage is called the Baker's Per Cent Method. The Baker's Per Cent Method is based on flour being 100 per cent of the formula. Baker's percentages for breads and sweet dough recipes are provided on Recipe Card D–G–3. True percentages and Baker's percentages are used in adjusting a recipe to yield a specific number of servings, to produce a specific number of smaller or larger servings, or to use the amount of ingredients available. To adjust a recipe to yield a specific number of servings:

USING TRUE PERCENTAGES

Step 1—obtain a working factor by dividing the number of servings needed by 100.
For example: 436 servings needed + 100 = 4.36 working factor.

Step 2—multiply the working factor by the total weight of the recipe to obtain the pounds desired. (Note: the total weight of the recipe is listed at the bottom of weight column on each recipe card.)
For example: 4.36 (working factor) × 19.86 (weight of recipe) = 86.99 (lbs desired).

Step 3—Multiply 86.99 (lbs desired) by the per cent of each ingredient in the recipe.
For example: Sweet Dough (Recipe Card D–36)

Yeast	2.52% × 86.99 =	2.19 lb =	2 lb 3 oz
Water	18.88% × 86.99 =	16.42 lb =	16 lb 6¾ oz
Milk	1.50% × 86.99 =	1.31 lb =	1 lb 5 oz
Eggs	8.81% × 86.99 =	7.66 lb =	7 lb 10½ oz
Sugar	8.81% × 86.99 =	7.66 lb =	7 lb 10½ oz
Salt	.95% × 86.99 =	.83 lb =	13¼ oz
Shortening	8.18% × 86.99 =	7.12 lb =	7 lb 2 oz
Flour	50.35% × 86.99 =	43.80 lb =	43 lb 12¾ oz
Total	100.00%	86.99	87 lb

Figure 9. Recipe conversion from Armed Forces Recipe Service for true percentages method.

RECIPE CONVERSION

Most of the recipes for breads and sweet doughs have an additional column on the left side of the recipe card for true percentages. True percentages are based on the total weight of all the recipe ingredients, the sum of which adds up to 100 per cent. Another method of determining recipe or formula percentage is called the Baker's Per Cent Method. The Baker's Per Cent Method is based on flour being 100 per cent of the formula. Baker's percentages for breads and sweet dough recipes are provided on Recipe Card D G-3. True percentages and Baker's percentages are used in adjusting a recipe to yield a specific number of servings, to produce a specific number of smaller or larger servings, or to use the amount of ingredients available. To adjust a recipe to yield a specific number of servings:

USING BAKER'S PERCENTAGES

Step 1--Obtain a working factor by dividing the number of servings needed by 100.
For example: 438 servings needed ÷ 100 = 4.38 working factor.

Step 2—Multiply the working factor by the total weight of the recipe to obtain the pounds desired. (Note: the total weight of the recipe is listed at the bottom of the weight column on each recipe card.)
For example: 4.38 (working factor) × 19.86 (weight of recipe) = 86.99 (lbs desired).

Step 3--To obtain the flour requirement, divide 86.99 (pounds desired) by the total standard formula percentage (See Recipe Card D-G-3) and multiply by 100 per cent.
For example: Sweet Dough (Recipe Card D-36).
86.99 (lbs desired) ÷ 198.60 (total standard formula percentage) = 0.438 × 100 (per cent of flour) = 43.80 flour required.

Step 4--To determine the weight of the other ingredients, multiply the weight of the flour by the per cent of each ingredient. (See Recipe Card D-G-3.)
For example: Sweet Dough (Recipe Card D-36).

Yeast	5.00% × 43.80 =	2.19 lb =	2 lb 3 oz
Water	37.50% × 43.80 =	16.42 lb =	16 lb 6¾ oz
Milk	2.97% × 43.80 =	1.31 lb =	1 lb 5 oz
Eggs	17.50% × 43.80 =	7.66 lb =	7 lb 10½ oz
Sugar	17.50% × 43.80 =	7.66 lb =	7 lb 10½ oz
Salt	1.88% × 43.80 =	.83 lb =	13¼ oz
Shortening	16.25% × 43.80 =	7.12 lb =	7 lb 2 oz
Flour	100.00% × 43.80 =	43.80 lb =	43 lb 12¾ oz
Total	198.60	86.99	87 lb

Figure 10. Recipe conversion from Armed Forces Recipe Service for baker's percentages method.

Ingredients	Recipes					
	Hot Rolls D-33	Kolaches D-27	Onion Rolls D-35	Pizza D-31	Raised Doughnuts D-19	Sweet Dough D-36
FLOURS						
Flour, wheat, hard	100.00	100.00	100.00	100.00	61.90	100.00
Flour, wheat, soft					38.10	
EGGS						
Eggs, whole		16.67			9.52	17.50
FAT						
Shortening	13.54	20.83	8.33		10.71	16.25
Oil				5.92		
FLAVORING						
Vanilla					1.79	
LEAVENING						
Yeast, active, dry	1.82	4.17	1.30	1.98	3.38	5.00
LIQUID						
Water	14.58	29.17	10.42	63.16	28.57	15.00
	45.83	33.33	37.50		22.62	22.50
MILK						
Nonfat, dry	4.17	5.22	3.38		4.17	2.97
VEGETABLES						
Onions			25.00			
SPICES AND CONDIMENTS						
Nutmeg					.30	
Salt	1.82	1.57	2.08	1.33	1.79	1.88
Pepper				.11		
SUGAR						
Granulated	12.50	1.05	10.42		17.86	17.50
		20.83				
Total Standard Formula Percent	194.26	232.84	198.43	172.50	200.90	198.60

Table 2. Rolls, set dough, danish pastry, and pizza formula based on 100 percent flour

GUIDE FOR PREPARATION OF YEAST BREADS

1. The temperature of the water in which the yeast is dissolved is important. If temperatures over 110° F. are used, the yeast will be killed. If temperatures under 105° F. are used, the growth or development of the yeast will be retarded.
2. The amount of water required may vary from that specified in the recipe due to variable amounts of moisture in the flour.
3. Full mixing or dough development produces better volume and lighter yeast products.
4. Lightly grease the bowl in which the dough is allowed to rise. Heavy greasing may cause streaks in the bread.
5. Yeast dough is ready to be punched when it is light and approximately double in size. Press the dough lightly with a finger tip. If the impression remains and the dough recedes slightly, the dough is ready to be punched.
6. Punching should be just enough to expel gases.
7. The dough for rolls is usually softer than that for loaf bread.
8. Do not overproof Danish Pastry. Overproofing will destroy flaking properties.

Figure 11. Guide from Armed Forces Recipe Service for preparation of yeast breads.

Table 3. Characteristics of good quality breads

CHARACTERISTIC	BISCUITS	MUFFINS	YEAST BREADS
Color	Uniform golden brown top and bottom. Inside creamy white. Free from yellow or brown spots.	Uniform golden brown outside. Inside creamy white or slightly yellow but free from streaks.	Even rich brown color, creamy white inside and free from streaks.
Shape and size	Uniform in shape and size, with straight sides and a smooth level top. The volume is at least twice the size of the unbaked product.	Uniform shape and size. Well rounded pebbled top, free from peaks or cracks.	Well proportioned, symmetrical with a well rounded top.
Crust	Tender and moderately smooth. Free from excess flour.	Tender, with a thin, slightly rough or pebbled shiny appearance.	Crisp-tender with an even thickness over entire loaf. Free from cracks and bulges.
Texture	Slightly moist, tender and flaky crumb, with a medium fine grain.	Moist, tender and light crumb, with medium fine, evenly distributed air spaces.	Soft, springy texture, tender and slightly moist with fine grain thin-walled cells.
Flavor	Pleasing, well blended flavor with no bitterness.	Pleasing, well blended flavor with no bitterness or other off-flavors.	Wheaty, sweet nut-like flavor. No off-flavors.

16. SWEET DOUGHS. Among the various yeast-raised doughs made in the dining facility, sweet dough is one of the most common. It is made from formulas high in sugar, shortening, eggs, and other enriching ingredients. Sweet-dough formulas may be rich or lean, according to the percentage of eggs, shortening, sugar, and milk solids used. Formulas vary according to the product for which the dough is used (table 5). The baker may produce a variety of products from each type of dough by using a variety of shapes, by using different fillings in makeup, and by varying the finish or glaze of the baked product (fig. 12).

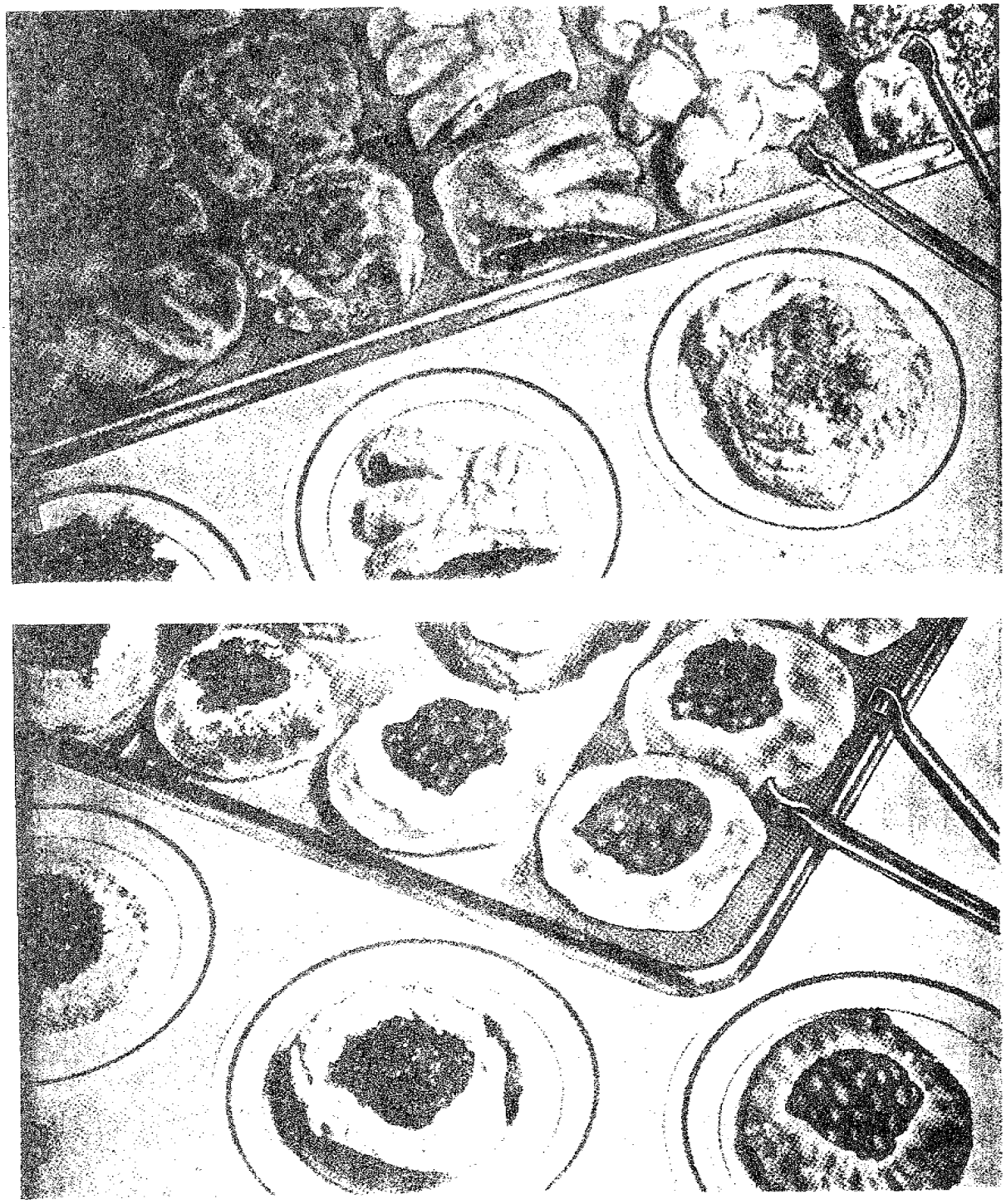
a. METHOD OF PREPARATION. The method of preparation for each type of sweet dough is given on the recipe card. Armed Forces Recipe Service gives two methods for retarded-sweet-dough preparation. Retarded sweet dough is yeast dough that is placed in refrigeration for a period of time before baking. Refrigeration temperatures retard the fermentation process of the dough, but do not change the quality of the end product. Savings in production time of sweet doughs can amount to as much # 66 percent of a baker's time when the retarded method is used in place of the normal fermentation.

CHARACTERISTIC	BISCUITS	MUFFINS	YEAST BREADS
Outside Appearance			
Shape irregular	Too much liquid. Dough not rolled to uniform thickness. Improper cutting of dough. Uneven oven heat.	Too much flour. Not enough liquid. Overmixing. Too much batter in pan. Oven too hot.	Improper shaping. Too much dough for pan. Insufficient proofing time.
Color			
Too dark	Oven too hot. Overbaking.	Too much sugar. Oven too hot. Overbaking.	Too much sugar or milk. Insufficient fermentation time. Oven too hot.
Too pale	Dough too stiff. Oven not hot enough, insufficient sugar.	Overmixing. Oven not hot enough. Underbaking.	Not enough sugar or milk. Dough too warm during mixing and excessive fermentation. Oven not hot enough.
Crusts			
Tough or hard	Too much flour. Overmixing. Oven too hot or overbaking.	Too much flour or not enough sugar or shortening. Overmixing.	Not enough shortening. Overbaking. Insufficient fermentation.
Irregular	Rough or blisters due to too much liquid, incorrect kneading or rolling.	Peaks due to mixture being too stiff, overmixing or oven too hot.	Blisters due to improper make-up.
Too smooth		Too much liquid or overmixing.	
Inside Appearance			
Color streaks or spots	Too much leavening. Ingredients not well mixed.	Eggs and milk not well blended.	"Crusting" during fermentation of dough. Undermixing. Too much dusting flour used during make-up.
Coarse or uneven grain.	Too much leavening, not enough liquid, or improper mixing. "Not flaky" due to not enough shortening or improper mixing of shortening and flour.	Insufficient beating of eggs. Too much or not enough leavening. Overmixing. Tunnels due to not enough liquid or shortening or overmixing.	Improper make-up, excessive water or under or over mixing.
Texture			
Too dry	Dough too stiff. Overbaking. Oven not hot enough. Not enough sugar or shortening.	Batter too stiff. Overbaking. Too much leavening. Not enough sugar and/or shortening.	Overproofing. Not enough water or improper mixing time.
Crumbly	Too much leavening, sugar or shortening. Not enough liquid.	Not enough liquid. Too much baking powder. Oven not hot enough.	Not enough water, improper mixing time.
Tough	Not enough shortening or leavening. Too much liquid. Dough too cold or oven not hot enough. Overmixing.	Not enough shortening or sugar. Overmixing.	Not enough shortening. Insufficient proofing time. Overbaking.
Heavy	Wrong proportion of ingredients. Improper mixing. Oven not hot enough or dough too stiff.	Not enough baking powder or shortening. Overmixing.	Underproofing or overmixing.
Poor Flavor	Wrong proportion of ingredients or improper mixing.	Wrong proportion of ingredients or improper mixing.	Wrong proportion of ingredients. Fermentation time too long.

Table 4. Causes of poor quality breads.

Table 5. Comparison on sweet-dough ingredients for different kinds of finished products

INGREDIENT	BASIC SWEET DOUGH	COFFEE CAKE	DANISH PASTRY	KOLACHES
	(BASED ON TRUE PERCENTAGES)			
Flour, bread	50.35		40.00	42.95
Flour, pastry		24.88		
Water, warm (105° to 110° F.)	18.88	23.11	9.38	12.53
Yeast, active dry	2.52		1.25	1.79
Salt	.95	.45	.62	.67
Sugar	8.81	24.88	3.75	9.40
Shortening	8.18	11.55	5.00	8.95
Milk, nonfat, dry	1.50	2.67	.94	2.24
Eggs	8.81	10.67	8.75	7.15
Butter			20.00	
Other:				
Vanilla		.45	.31	
Baking powder		1.34		
Water, cold			10.00	
Water, room temperature				14.32
	100.00	100.00	100.00	100.00



A. Sweet doughs

B. Kolaches

Figure 12. Baked items made from sweet dough.

b. SUGGESTIONS FOR CONTROL OF QUALITY. The mixing of a sweet dough is no more complex then the mixing of any other yeast-raised dough. The following suggestions should be followed to obtain a quality, sweet-dough product:

(1) Follow the sequence of dough production outlined in the standard recipe.

(2) Ferment sweet dough as prescribed in the recipe.

(3) If the dough is to be given normal fermentation, floor time, and makeup, bring it from the mixer at 78° to 82° F.

(4) Because the makeup time for different types of sweet rolls and coffee cakes varies so much, start the makeup while the dough is on the young side and obtain longer bench tolerance.

(5) When using the retarded-sweet-dough method, mix the dough during a slack work period if possible.

(6) Shape the finished dough piece so that the finished product will have eye appeal.

(7) Plan for retarded-sweet-dough items to be baked off by someone other than the baker just in time to supply hot items for the serving time.

c. JUDGING THE QUALITY. The temperature of the ingredients affects texture, tenderness, and keeping quality of sweet doughs. Methods of mixing are usually given for ingredients at room temperature (75° F.). The standard recipe indicates the amount of ingredients, temperature for mixing, mixing speed and time, plus the baking temperature and baking time.

(1) A gelatinous consistency may be caused by an excessive amount of liquid in proportion to flour.

(2) A dry, breadlike product that stales quickly is one of the results of overmixing.

(3) Tunnels, peaks, smooth crust, and poor browning may also be the result of overstirring.

(4) A coarse texture may be the result of undermixing.

17. DOUGHNUTS. Three types of dough formulas are used in making doughnuts: Cake dough, yeast-raised sweet dough, and commercially prepared, cake-doughnut mix procured for the military services. Doughnuts made from cake dough are chemically leavened with baking powder or a combination of soda and an acid ingredient. The doughnut mixes

are also chemically leavened. Yeast-raised doughnuts are made from a rich sweet dough in which yeast is used for leavening. Yeast-raised doughnuts are made by the standard recipe: the dough is mixed, fermented, rolled out, cut by hand or machine, proofed to the proper size, fried in deep fat, and glazed or coated, as desired. Dry coatings are used most often on cake doughnuts, and glazes are usually applied to the yeast-raised type.

a. METHOD OF PREPARING RAISED-YEAST DOUGHNUTS. Basically, the doughnut formula is a sweet dough with the formula varied somewhat. Major changes are leavening, eggs, water and shortening are decreased and nonfat dry milk is increase. The standard recipe lists the ingredients and gives the method of preparation.

b. SUGGESTIONS FOR CONTROL OF QUALITY. The following suggestions should help to obtain quality, raised-yeast doughnuts:

(1) Control the mixing temperature so that the dough laves the mixer at 90° F.

(2) Limit mixing time to about 7 minutes. (The dough should be medium soft.)

(3) Do not stretch dough unnecessarily because stretching tends to make the dough absorb a greater amount of fat during frying.

(4) Cut the doughnuts carefully to preclude overlapping of cuts and to avoid waste of dough. Reworked and rerolled doughs do not give cut doughnuts a smooth surface.

(5) Prepare dough that is to be cut and dispensed by an automatic machine by a different formula that requires more liquid. (Usually, cake doughnut formulas are used for this purpose.)

(6) Cool doughnuts to room temperature before sugaring them.

(7) Cool doughnuts to 160° F. before glazing them. A doughnut coming from a 375° F. fat will cool to this temperature in about 1 to 2 minutes.

c. JUDGING THE QUALITY. The quality of ingredients is just as important in doughnut production as it is in the production of other yeast-raised items. Extreme care in mixing, fermentation, and makeup is essential to high-quality doughnut production. Listed below are some factors that influence the quality of the finished product:

(1) The sugar content in yeast-raised doughnuts controls to a certain extent the amount of browning and fat absorption during the frying.

(2) Doughs that are less than 90° F. absorb more fat during frying.

(3) Smooth surface of dough greatly influences the frying time and evenness of brown color.

(4) Overcooked doughnuts do not sugar well; the sugar sheds off rapidly.

(5) A sugared doughnut appearing moist on the surface may be undercooked.

(6) One of the most common reasons for undercooking or overcooking is too much moisture in the formula.

(7) Air circulation around the entire doughnut is Important to setting the glaze.

(8) Glaze should be sufficiently thin to flow and to allow excess to roll off.

18. PIZZA. Almost any lean dough formula can be used for making pizza, an all-time favorite in the dining facility. The major difference between a particular formula for pizza end a lean breed-dough formula is that the yeast is not fed; that is, sugar is not an ingredient in a pizza formula because it is not needed to supply the energy to the yeast. Volume is not a factor in fermentation of pizza dough. Fermentation for pizza is relatively short in comparison with other breed doughs, and makeup consists only of flattening dough to the required dimension. The standard recipe in Armed Forces Recipe Service gives the amount of ingredients and the method of preparing a dough for pizza.

SECTION V

QUICK BREADS

19. GENERAL. Quick breads are so called because they are leavened by quick-leavening agents such as baking powder. A certain amount of levening is also done by steam. A wide assortment of baked items are leavened by air mixed into the batter, by incorporating a chemical (baking powder), or by a combination of the two. Included in this group are baking-powder biscuits, quick coffeecakes, cornbread, creampuffs, éclairs, cake doughnuts, dumplings, fritters, gingerbread, muffins, scones, shortcake, and yorkshire pudding. The time required for mixing and baking quick breads is comparatively shorter than that required for yeast-raised products. The quality and quantity control of these products is important because of their rapid staling rate. In addition to the quick-bread doughs, batter mixtures are included in the quick-bread category because of their similarity.

20. CLASSIFICATION OF QUICK BATTERS AND DOUGHS. Mixtures leavened by steam, incorporated air, or chemical agents make up into different kinds of batters and doughs. The ingredients of batters and doughs include flour, baking powder, salt, liquids, fats, eggs, sugar, and flavorings. Depending on the consistency of the mixture, they are classified as soft batten and roll-out doughs.

a. SOFT BATTERS. Soft batters contain various amounts of liquid and are of two types:

(1) POUR BATTERS. Pour batters are thin enough to be poured directly from containers into cooking pans. An example of this type is griddle-cakes batter.

(2) DROP BATTERS. Drop batters are thick enough to require spooning into cooking containers. Muffin batter is an example of this type.

b. ROLL-OUT DOUGHS. Roll-out doughs are classed as soft doughs and stiff doughs. Soft doughs include baking-powder biscuits and dumplings, and stiff doughs include cake doughnuts and scones.

21. BISCUITS. Biscuit dough contains more flour than liquid and has a consistency that can be kneaded. The proportion of the liquid to dry ingredients is extremely important in the production of a satisfactory product, because the dough should be soft, not dry or stiff. Doughs should be kneaded slightly to develop the flour gluten and to distribute the shortening evenly.

a. METHOD OF PREPARATION. The standard recipe for baking-powder biscuits, from Armed Forces Recipe Service (fig. 13), lists the ingredients and gives the method of preparation.

b. SUGGESTIONS FOR CONTROL OF QUALITY. Baking-powder biscuits should be baked at the temperature listed in the standard recipe. The following suggestions should help in producing a good finished product:

BAKING POWDER BISCUITS

YIELD: 100 Portions (4 Pans)					EACH PORTION: 2 Biscuits
PAN SIZE: 18 by 26-inch Sheet Pan					TEMPERATURE: 450° F. Oven
PER CENT	INGREDIENTS	WEIGHTS	MEASURES		METHOD
50.66	Flour, wheat, hard, sifted	12 lb	3 gal		1. Mix and sift dry ingredients together.
3.43	Milk, nonfat, dry	13 oz	2⅞ cups		
2.64	Baking powder	10 oz	1½ cup		
1.06	Salt	4 oz	6 tbsp		
10.56	Shortening	2 lb 8 oz	1½ qt		2. Blend shortening into dry ingredients until mixture resembles coarse cornmeal.
31.65	Water	7 lb 8 oz	3¾ qt		3. Add water and mix only enough to form a soft dough.
100.00		23 lb 11 oz			4. Place dough on lightly floured board. 5. Roll or pat out to a uniform thickness of ½ inch. 6. Cut with 2½ inch floured biscuit cutter. Place biscuits in pans in rows 6 x 9. 7. Bake 15 minutes or until lightly browned.

NOTE: 1. 16 lb Biscuit Mix may be used to make baking powder biscuits. Mix according to instructions on container.
2. For browner tops, 8 oz (1 cup) granulated sugar may be added in Step 1.

Figure 13. Standard recipe for baking powder biscuits from Armed Forces Recipe Service.

(1) Use only the minimum amount of water that the dry ingredients can absorb. Allow for the condition of the flour and the moisture in the atmosphere. The dough should not be wet but should be soft and barely sticky.

(2) Take care not to overkneed; about 1 minute is sufficient time. Kneading produce a biscuit of greater volume with a more even texture and a smoother crust.

(3) Dip the dough cutters in flour, and tap them lightly to remove excess flour. Make certain to cut so that rounds do not overlap.

(4) Combine the scrap dough with unrolled dough..

(5) Grease the baking sheets lightly.

(6) Brush the tops lightly with a liquid or with butter wash to produce more crustiness. Melted fat browns and crisps the biscuit faster then milk does.

c. JUDGING THE QUALITY. Table 6 shows some causes of faulty baking-powder biscuit Figure 14 illustrates the qualities on which to judge the finished product.

Table 6. Causes of faulty baking powder biscuits

Faulty Characteristics	Cause
Tough	Too much mixing. Batter too cold. Too little fat. Too much liquid. Insufficient baking powder. Cold oven.
Coarse	Improper mixing. Batter too warm. Too little liquid. Too much baking powder.
Dry	Batter too stiff. Overbaked. Cold oven. Too little shortening.

Table 6 (Continued)

Faulty Characteristics	Cause
Flat and heavy	Improper mixing. Batter too stiff. Wrong proportion of ingredients. Batter too cold. Oven too cold.
Hard crust	Baking too long. Baking temperature too high. Cold oven.
Crumbly	Too much fat. Too much baking powder. Too little liquid.
Pale crust	Oven too slow. Dough too stiff.

22. MUFFINS. Muffins are a quick bread in the truest sense of the term; the limited amount of stirring required to mix the batter accounts for its fast production. Fruit, nut, and cereal additions to the batter can give interesting flavor and texture contents.

a. METHOD OF PREPARATION. The standard recipes in Armed Forces Recipe Service list the ingredients and give the methods of preparation for the various types of muffins that appear on the mater menu. The usual method of mixing it to sift the dry ingredients together, blend in the liquids, and stir until all dry ingredients are moistened. After mixing, the batter should appear very lumpy.

b. SUGGESTIONS FOR CONTROL OF QUALITY. Listed below are some suggestions for the preparation of muffins that should help to insure a good finished product:

(1) Do not overmix.

(2) Fold in fruit, nut, and other additions just before panning

(3) Gram only the bottoms of the muffin tins to allow for rapid volume expansion when the mixture is first placed in the oven.

c. JUDGING THE QUALITY. Figure 16 shows a well-prepared muffin with a well-rounded top crust, an even grain, end a uniform texture. If a poor quality is produced, the characteristics shown in table 7 may be used as guide for determining the cause.

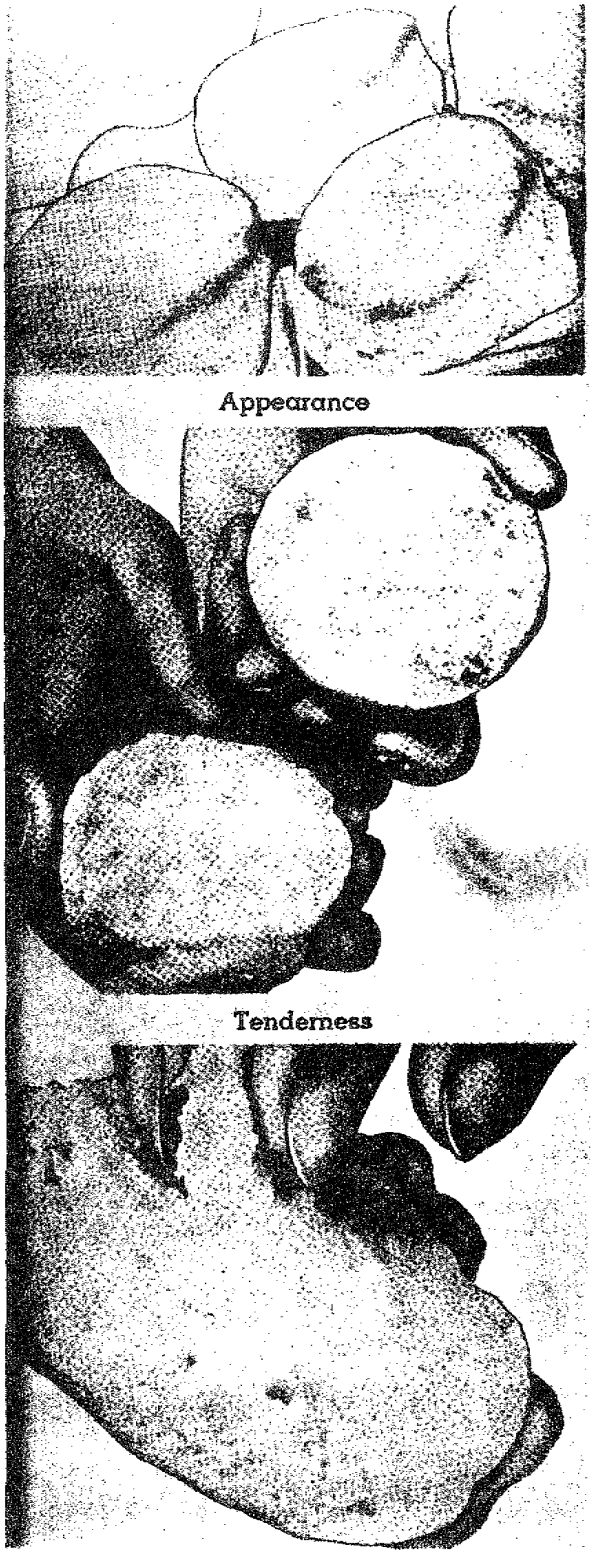


Figure 14. Properly baked biscuits.

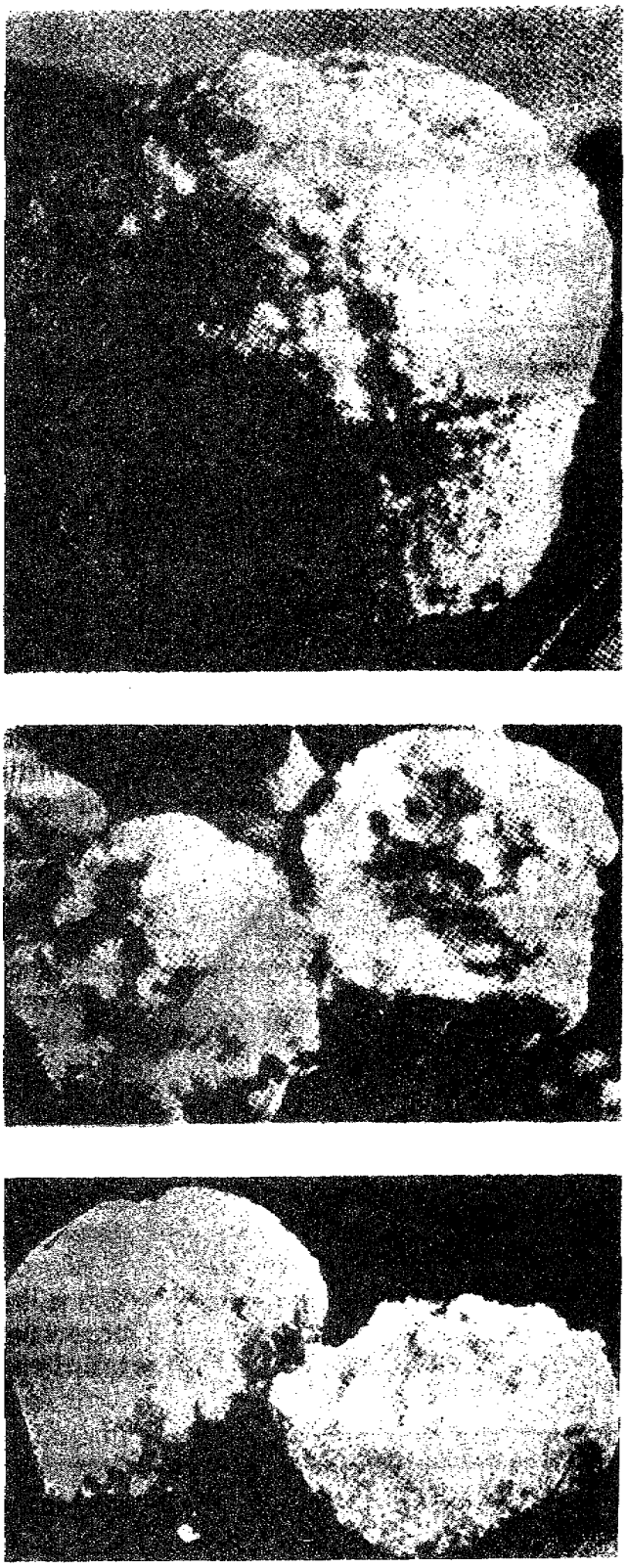


Figure 15. Well-prepared muffins.

Table 7. Causes of faulty muffins

Faulty Characteristics	Cause
Tough	Too much mixing. Wrong ingredient proportion. Too little sugar or shortening.
Dry	Batter too stiff. Overbaked. Too much baking powder. Too little sugar and/or shortening.
Smooth crust	Too much mixing.
Tunnels	Too little or too much batter in muffin cup. Too much mixing. Too little liquid and/or shortening. Overgreased muffin tin.
Heavy, uneven grain	Insufficient leavening. Undermixed. Too little shortening.
Peaks	Mixture too stiff. Too much mixing. Oven too hot. Pans filled too full.
Browned unevenly	Wrong oven heat. Wrong ingredient proportion. Insufficient mixing.
Poor flavor	Improper mixing. Poor ingredients.

23. CORNBREAD. Cornbread, yankee or southern style, is mixed by the same method used for muffins, but is considered a pour batter. Cornbread should be judged according to the standards described for high-quality muffins (pars 22c). Either sheet pans or muffin tins may be used for baking cornbread.

24. QUICK COFFEECAKE. The batter for quick coffeecake is mixed by the cake method (para. 3a). The conventional method includes these steps: Add melted shortening, vanilla and water to eggs and gradually add dry ingredients. Quality control and Judging of quick coffeecakes are the same as for cakes (pare 33b and c).

25. FRITTERS. The muffin method is used for mixing fritters; that is, dry ingredients are sifted together, and liquid ingredients are combined and added either with or without melted shortening. The amount of mixing is a less critical factor in the production of fritters than in the production of other quick breads because of the high ratio of liquid to flour. There is less tendency to overdevelop the flour gluten because ingredients mix easily. The standard recipe in Armed Forces -Recipe Service lists the ingredients and gives the methods for preparing fritters. Fried fritters should be thoroughly drained after frying. Since fritters lose crispness if allowed to stand on the steamtable, they should be fried in small batches as needed. After the fritters rise to the top of the fat, care should be taken to insure that they are removed when the proper browning take place.

SECTION VI

CEREALS, PASTE PRODUCTS, AND STARCHES

26. GENERAL. Cereals are made of wheat, oats, corn, rice, rye, and barley. They are often considered as breakfast foods, but are not limited to the breakfast meal. Cereals are divided into two main classifications, those that are ready to cook and those that are ready to eat. Some cereals are made of one grain, and others of a combination of grains. Macaroni, noodles, and spaghetti are the most popular of the paste products. Paste products are made from flour high in gluten content. Cereals and paste products are starchy foods and are good sources of carbohydrates, which supply energy. Starches in the form of flour starch, corn starch, potato starch, and tapioca (made from the cassava root) are used to thicken gravies, soups, and puddings.

27. READY-TO-EAT CEREALS. Ready-to-eat cereals have been processed during manufacture so that they can be eaten as taken from the package. These cereals, which are quick to prepare and convenient to use, save time and add variety to the menu. They should be stored in tightly covered containers in a cool, dry place and should not be opened until ready to be served. Fruits may be provided to add variety to the cereal.

28. READY-TO-COOK CEREALS. Ready-to-cook cereals fall into three groups: Small granules such as corn meal or farina, flaked grains such as rolled oats, and whole grains such as rice and hominy. The objective in cereal cookery is to gelatinize the starch and to soften the cellulose, thereby improving the flavor and texture and contributing to the ease and completeness of digestion.

a. PRINCIPLES FOR COOKING CEREALS. Ready-to-cook cereals are cooked with boiling water by the method that will prevent lumps. Various types of ready-to-cook cereals should be prepared as follows:

(1) Farina and corn meal are mixed with cold water to make a paste which is then added to boiling water.

(2) Hominy grits, rolled oats, and whole-wheat meal are added directly to boiling water.

(3) Rice is added to the appropriate amount of cold water, brought to a boil, and then covered tightly and simmered until done.

b. SUGGESTIONS FOR CONTROL OF QUALITY. Instructions for cooking each type of cereal are given in Part E of Armed Forces Recipe Service. Each cereal should be cooked the length of time specified in the recipe or cooked according to the special instructions on the package. The following suggestions should help in controlling the quality of cooked cereals:

(1) Extremely hard water may require that rice be cooked for a few extra minute.

(2) When rice is boiled rapidly, the kernels tend to break down, and the rice becomes mushy.

(3) If it becomes necessary to reheat cold cooked cereals such as farina, oatmeal, and rolled wheat, it should be done in a double boiler. The cereal should not be stirred until it is well heated. If the cereal is too thick, a little hot water should be added.

(4) Vigorous stirring of cereal while it is cooking tends to produce a sticky and gummy mass.

(5) Cereals which are kept covered while cooking are more evenly moist than those not covered. The use of a cover also prevents a dry coating from forming on top of the cereal.

(6) The starch in cereals cooks quickly. It is best to cook cereals only a short time before serving.

c. JUDGING THE QUALITY. Cooked cereals should be free of lumps and should have a consistency that is just moist enough to retain shape when the cereal is served into dishes. Grains of cooked rice should be light textured, and each grain should stand separately. Enough salt should be used in cooking the cereal to bring out the full flavor of an otherwise bland product. Cereals should be cooked until the pasty appearance and starchy taste have disappeared.

29. PASTE PRODUCTS. Paste products such as noodles, macaroni, and spaghetti are easily prepared and served. The standard recipe (E. Cereals and Paste Products No. 4, Armed Forces Recipe Service) gives instructions for cooking these products. Care should be taken to avoid overcooking, especially when the paste product is to be combined with other foods in making casseroles or other baked dishes.

30. STARCH AS A THICKENING AGENT. Products thickened with flour or other starches, such as gravies, white sauces, cream fillings, and puddings, require special consideration to obtain the desired viscosity (consistency) and to give a smooth opaque gel. The same amount of different starches does not produce starch gels of equal firmness. Cornstarch produces a gel that is firm whereas potato starch produces a gel that is more like a soft liquid paste. A dispersing agent such as fat, sugar, or cold liquid mixed with the starch is necessary to prevent lumping when the starch is cooked. For a firm gel, most starches of ordinary concentration need to be cooked at a minimum temperature of 195° F. When a mixture of starch and water is heated, the starch granules absorb water, swell, and form a viscous solution. The thickening of this solution reaches a maximum at just below the boiling point (212° F.). However, a starch-thickened mixture thins when heated for a prolonged length of time at a temperature of more than 195° F.

a. METHOD OF PREPARATION. Except for the instant puddings, which control specially treated starches, the swelling of starch takes place only during cooking. When the swelling has reached a maximum, the starch is gelatinized (cooked). Pure starch is transparent at this stage, whereas flour remains cloudy because of the protein content. Methods of mixing used in starch cookery are designed to disperse the starch

granules evenly throughout the product. The standard recipes indicate the amount of liquid and flour or other starch required for each food item and give the methods of combining the ingredients for the best results.

b. SUGGESTIONS FOR CONTROL OF QUALITY. Heat, acid, sugar, certain other products, stirring, and in some instances, egg cause starch gels to thin. A partial breakdown of the starch molecule to a simple nonsugar particle, dextrin, occurs in the heating of starch. This breakdown occurs in the dry state or in the presence of moisture. Dextrins have less thickening power than the original starch molecules had. Increased thickness is generally observed in most starch products with increased cooking, but some starches such as potato starch lose their capacity to hold water when heated. Acid hastens the breakdown of starches in direct proportion to the amount of acid present. Sugar decreases the stiffness of puddings and sauces; a white sauce with the same amount of cornstarch is much stiffer. Some of the starch thickeners may be used interchangeably; for example, flour is generally used in gravy, but cornstarch may be used as effectively. The following hints should be helpful in preparing and in using starches:

(1) The starch product should be heated quickly and stirred during the thickening process. Stirring should be discontinued, except to prevent sticking, after the particles are fully dispersed.

(2) The starch product should be cooked until the starch is fully swollen and transparent.

(3) Starch-thickened products become stiffer as they cool.

(4) Excessively browned drippings that are used to make gravy may hasten the breakdown of starches, and extra cooking will not thicken the gravy because the meat drippings continue their breakdown action.

(5) The cold-water paste made with flour is thicker than that made with an equal amount of pure starch thickeners such as cornstarch. (The gluten in the flour absorbs the water.)

(6) Eggs generally give additional thickness, as well as desirable flavor, to starch puddings.

(7) Butterscotch puddings may thin after the addition of eggs.

(8) Because some thinning of a sauce occurs when fruit juice is added to it, a gel that is thicker than that desired in the finished product is needed for the base. (The rinds of citrus fruits are added only for flavor; they have no effect on the thickening process.)

(9) The size of the batch affects the viscosity of the food, for it determines the cooking time and the amount of stirring necessary.

c. JUDGING THE QUALITY. Products with a starch base should be cooked until the starchy taste is gone. The viscosity should be acceptable for the finished product; that is, thick for puddings, thinner for gravies, and even thinner for sauces. The starch product should be free of lumps.

SECTION VII

CHEESE AND EGGS

31. CHEESE. Cheese is a high-protein food which is nutritionally comparable to meat. Cheese may be used as a substitute for meat or as a supplement to other foods. It is often used to add flavor and variety to many hot dishes and salads. Cheese usually appears in one of two forms: Natural or process cheese. Natural cheese is made by the coagulation, or curdling, of the milk by the use of an enzyme. The milk is stirred and heated, the whey is drained off, and the pressed curds are collected. The whey is either cured to alter the flavor and texture or is not cured. Pasteurized process cheese is made by blending a combination of two or more batches of natural cheese. The procedure consists of grinding, blending, heating with agitation, and adding a small amount of permissible emulsifying salts. Harmless coloring materials may also be added. The cheese is blended to a smooth mass which can then be poured into the final container. The Army buys both natural and pasteurized process cheese in a wide variety of packaged forms. The various kinds of American cheese are most commonly used for cooking. In general, a sharper, longer-aged cheese contributes more flavor and a better texture to cooked dishes than a mild cheese does. Cheese cannot withstand freezing; the taste becomes flat, and the texture dry and crumbly. However, if cheese should accidentally be subjected to abnormally low temperatures, it can be used in grated form.

a. METHODS OF PREPARATION. Cheese is the perfect companion to many foods, and it combines well with basic starchy foods to make hearty, satisfying main dishes such as macaroni and cheese, potatoes au gratin, cheese and rice, cheese and noodles, and cheese sandwiches. Popular cheese and egg dishes are soufflés, cheese omelets, and scrambled eggs and cheese. Cheese sauces add variety to many vegetables. They are also used in appetizers such as stuffed celery, cheese balls, and various hot cheese sticks and breads. Natural cheese melts more easily when shredded. Process cheese may be sliced, cubed, or shredded; it is sliced more easily if a wire cutter is used.

b. SUGGESTIONS FOR CONTROL OF QUALITY. Guidelines for using cheese, from Armed Forces Recipe Service, are shown in figure 16. Cheese like other high-protein foods, is toughened by high heat.

c. JUDGING THE QUALITY. Cheese that has been overcooked is stringy and tough, and often the butterfat separates from the protein.

32. EGGS. A properly cooked egg is delicate, tender, and easily digestible, whether it is soft cooked, hard cooked, fried, poached, scrambled, baked, or made into an omelet. The basic principle of egg cookery is to cook at low temperatures. Eggs can be used in preparing breads, cakes, desserts, salads, sandwiches, sauces, and soups. They can be combined in baked dishes with meat, vegetables, cereals, cheese, and fish. In addition, eggs are used as a leavener, as an interfering substance, as an emulsifier, as a thickening agent, as a binding agent, as an adhesive agent, and as a clarifying agent (fig. 17).

a. GENERAL USES OF EGGS IN COOKING. The following are some of the uses of eggs:

GUIDELINES FOR USING CHEESE

STORAGE

1. All cheeses require special care in handling before and after they are cut. Store in either a tightly covered container, wrapped in waxed paper or transparent plastic wrapping material in the refrigerator.
2. Hard and partially hard cheeses, like Swiss and Cheddar, have moderate to high keeping qualities. However, once cut, they will dry out rapidly, unless properly wrapped and refrigerated.

PREPARATION AND COOKING

1. Mold may form on any natural type cheese. The mold is harmless, but should be removed before the cheese is cooked or served.
2. Low temperatures should be used at all times in cheese cookery. Use a low heat and stir constantly or use a double boiler. When cheese is melted, it is cooked. High heat or prolonged cooking can toughen protein, cause fat separation and result in a stringy product.
3. When topping casseroles, sandwiches, and vegetables with cheese, cook the food item almost completely, then add the cheese, return to oven just long enough to melt and brown the cheese.
4. Cheese that is thoroughly chilled grates or shreds more easily than room temperature cheese.

SUBSTITUTION

1. Many recipes list "cheese" as an ingredient without a designated type. Any of the processed American or natural Cheddar cheese may be used on a direct weight basis:

a. Cheese, American, Processed, Pasteurized: Melts readily and blends easily; mild Cheddar flavor depends on age of cheese used in processing.

b. Cheese Food, American, Processed, Pasteurized: Melts more readily than processed or natural cheese and blends smoothly and quickly; slightly milder Cheddar flavor than American processed pasteurized cheese. Sliced cheese food is recommended for grilled cheese sandwiches and cheeseburgers.

c. Cheese, Cheddar, Natural: Melts less readily than processed cheese; mild to sharp Cheddar cheese flavor depending on age of the cheese.

2. Use of dehydrated cheeses

a. Cheese, Cottage, Dehydrated

1. USE—Dehydrated cottage cheese may be substituted in any recipe using fresh cottage cheese.
2. PREPARATION—Measure 8½ cups water (70° F.) into a shallow serving pan. Pour 1-No. 10 can (17 oz) canned dehydrated cottage cheese evenly over the water. Stir gently to wet all particles of cheese. Let stand 5 minutes and then stir gently. If more water is needed, sprinkle ½ to 1 cup water over cheese. Chill rehydrated cheese thoroughly before serving (3 to 4 hours).
3. SUBSTITUTION—Rehydration ratio: 1 pound dehydrated cottage cheese to 4 pounds (2 qt) water.

Fresh	Dehydrated	Water Added	Rehydrated
6 lb (3 qt)	1-No. 10 can (17 oz (2¾ qt))	8½ cups	5 lb 1 oz (3 qt)
12 lb (1½ gal)	2-No. 10 can (34 oz (5½ qt))	4¼ qt	10 lb 2 oz (6⅛ qt)

b. Cheese, Processed, American, Dehydrated

1. USE—Dehydrated processed American cheese may be substituted in any recipe using processed American cheese. Rehydrate dehydrated cheese before adding to any recipe to eliminate any unrehydrated cheese in the end product.
2. PREPARATION—Add water to cheese and mix until blended. For a moist, semi-solid cheese, as for an appetizer or omelet, use 1 pound (1 qt) dehydrated cheese and 8 fluid oz (1 cup) water. For a semi-fluid cheese for sauce (better volume substitute), use 1 pound (1 qt) dehydrated cheese and 16 fluid oz (2 cups) water.
3. SUBSTITUTION—

Fresh	Dehydrated		Water Added	Rehydrated
1 lb	Semi-solid	6 oz (1½ cups)	3 fl oz	9 fl oz
8 lb		3 lb (3 qt) 1-No. 10 cn	3 cups	2⅛ qt
1 lb	Semi-fluid	6 oz (1½ cups)	6 fl oz	12 fl oz
8 lb		3 lb (3 qt) 1-No. 10 cn	6 cups	3 qt

CH-3

Figure 16. Guidelines from Armed Forces Recipe Service for using cheese.

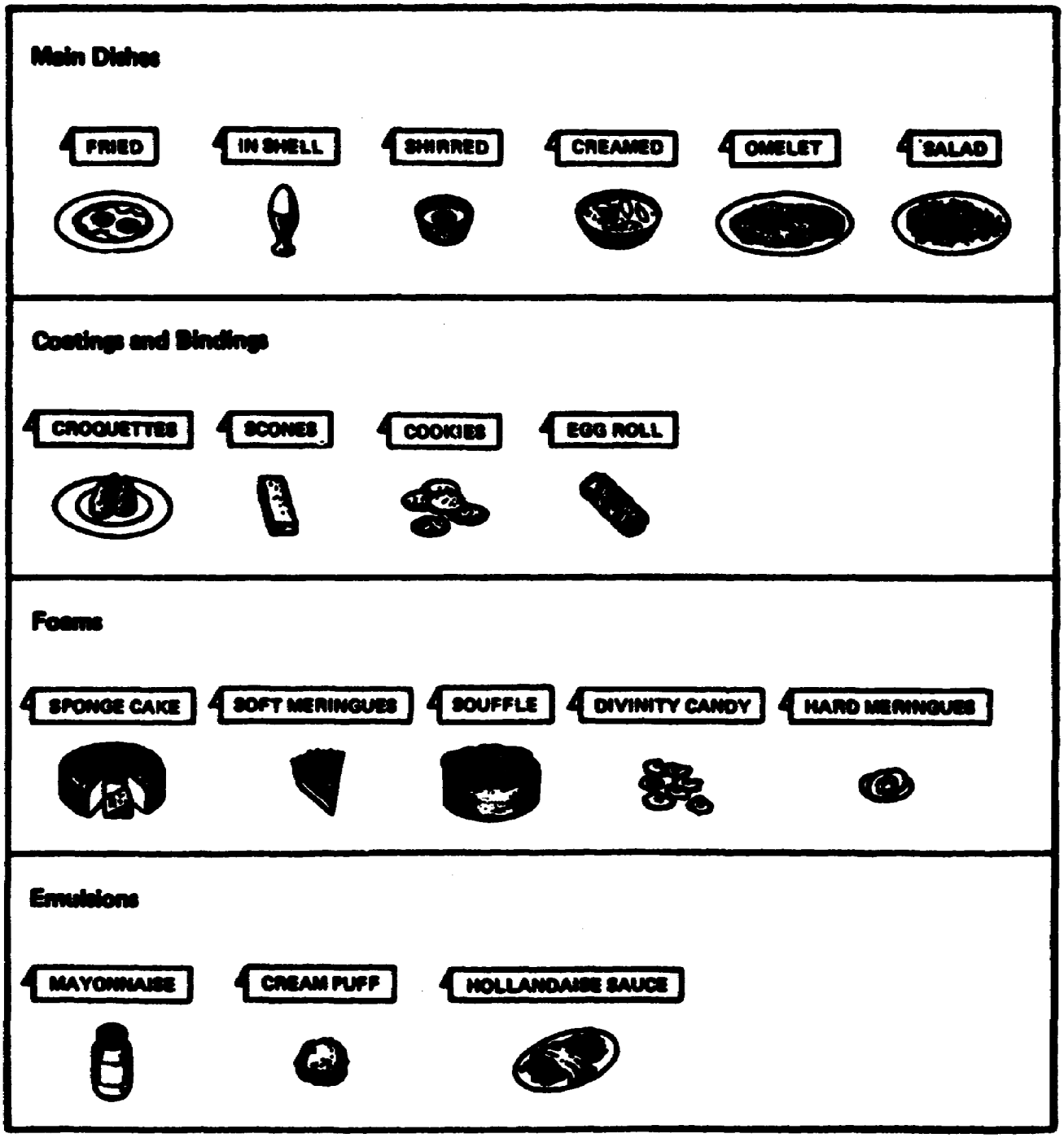


Figure 17. Uses of eggs.

(1) LEAVENER. When an egg is beaten, it forms a foam of tiny bubbles. When these bubbles are incorporated into a mixture and heat is applied, the bubbles expand and raise or lighten the product. As heat reaches each bubble, it coagulates, thus preventing the finished product from collapsing when it cools. Whole eggs can be whipped to increase their volume about 6 times; egg whites, about 7 to 8 times; and egg yolks, about 2 times.

(2) INTERFERING SUBSTANCE. Beaten egg, especially the white, is used as an interfering substance in frozen dishes such as ice cream and sherbet by preventing small crystals from coming together. Egg white and sometimes egg yolk have a similar effect in candy and in some kinds of frosting by interfering with the formation of large sugar crystals, thereby helping to keep the candy or frosting creamy.

(3) EMULSIFIER. Certain substances such as oil and water (or vinegar) will not mix together. In the presence of other substances called emulsifiers, the tiny globules of fat remain suspended in the water and do not easily separate. Egg yolk is the most efficient emulsifying agent known; one egg yolk can emulsify from 1 to 1 1/2 cups of oil. Mayonnaise is an emulsion of oil and vinegar held together by egg yolks or whole eggs as the emulsifying agent. Eggs act in the same way in many other foods such as cakes which contain fats.

(4) BINDING AGENT. Eggs are used in meat loaves, vegetable molds, and other combinations to bind the mixture together. During the cooking, the eggs become firm and hold the mixture in the desired shape.

(5) ADHESIVE AGENT. Croquettes, chops, and pieces of chicken are first dipped in egg and then in crumbs. The beaten eggs hold crumbs tightly and keep them in place during cooking and serving.

(6) CLARIFYING AGENT. Broths and coffee are sometimes clarified of suspended particles by adding egg whites. As the egg coagulates, it enmeshes the suspended material, and the strained liquid has more clarity and sparkle.

(7) THICKENING AGENT. One egg when mixed and heated properly with 1 cup of milk forms a jellylike baked custard, or a smooth thickened stirred custard. One whole egg or two yolks have about equal ability to thicken 1 cup of milk. Lightly beaten eggs thicken better than those well beaten. Spoon bread, corn pudding, and noodle rings are examples of main dishes using eggs as the thickening agent.

b. PREPARATION OF EGGS. Armed Forces Recipe Service contains many recipes for cooking eggs in the shell and for poaching, frying, scrambling, and baking them. On a percentage basis (equal weights) the nutritive contributions of eggs are similar to those of lean meat. When recipes require dehydrated egg mixture, the method of reconstitution is also given.

c. SUGGESTIONS FOR CONTROL OF QUALITY. Guidelines for using .eggs, from Armed Forces Recipe Service, are shown in figure 18. Some additional hints are:

F-G. CHEESE AND EGGS No. 2

GUIDELINES FOR USING EGGS

Sanitary Precautions:

1. Fresh eggs should be refrigerated until ready to use. Frozen whole eggs and whites, once thawed, should not be refrozen.
2. Cracked whole fresh eggs should be used only in recipes requiring cooking. Never use in salad dressings and other uncooked dishes.
3. Dehydrated Egg Mix and frozen bakery type eggs should be used only in recipes requiring cooking.

Prepreparation:

1. Eggs may be removed from refrigeration about 1 hour before use. This practice will ensure uniform cooking when eggs are fried or baked, prevent cracked shells when soft or hard cooked in their shells, and will increase the volume of beaten egg whites.
2. When eggs are to be an ingredient in a recipe, or when two or more eggs are to be mixed or beaten together, the eggs should be broken separately into a small bowl. If one egg has a bad odor, appearance or color, it can be discarded without spoiling the remaining eggs or other ingredients.

Preparation and Cooking:

1. Avoid OVERCOOKING. Follow the times and temperatures prescribed in specific recipes for egg cookery.
2. Fried, poached, and soft cooked eggs should be prepared as required during the serving period.
3. Add ingredients gradually when folding into stiffly beaten egg whites.
4. To keep yolks of hard cooked eggs from discoloring, plunge eggs into cold water immediately after cooking.
5. When slicing hard cooked eggs, dip knife blade into cold water and the yolks will not crumble

Storage and Leftovers:

1. Leftover uncooked egg yolks may be steam cooked or poached, then put through a sieve and used to garnish green salads, soups, or cooked vegetables.
2. To keep leftover uncooked yolks from drying out, beat slightly with a fork; add 1 tablespoon cold water for each 2 yolks; cover and store in the refrigerator. Use only in recipes requiring cooking.
3. Store hard cooked eggs in their shells in the refrigerator until they are served. Shelled, hard cooked eggs will darken if stored for any length of time.

Figure 18. Guidelines from Armed Forces Recipe Service for using eggs.

(1) Eggs scrambled in excessive fat may lose some of their vitamin A, which is soluble in fat.

(2) Because poached eggs may lose some of the water-soluble riboflavin from the white to the cooking liquid, the liquid should be kept to a minimum.

(3) Once eggs are whipped to their maximum volume, further whipping only reduces the volume.

(4) If eggs are to be added to hot liquids, as in preparing a cream pie filling, a small amount of the hot liquid is first mixed thoroughly with the beaten egg to prevent curdling.

(5) If a starch thickener is used in puddings and ice cream, the thickener should be allowed to swell fully and to cook thoroughly before eggs are added.

(6) As soon as custard coats the spoon, the cooking should be stopped.

(7) Warm oils in mayonnaise emulsify more rapidly than cold oils; therefore, pauses in beating the mixture assist in the emulsification process.

(8) If mayonnaise begins to curdle, the mixture should be set aside and a new emulsion started. The curdled material may be added to the new emulsion in the same manner an oil would be used.

d. JUDGING THE QUALITY. Eggs are cooked to coagulate the proteins, to activate the protein avidin, which releases biotin (a vitamin which is not available until raw egg white is cooked), and to destroy any micro-organisms that may be present. Substances added to eggs change the coagulation temperature of the proteins. Salt and acids hasten the coagulation of egg proteins by lowering the coagulation temperature. Sugar raises the coagulation temperature; therefore, custards require a longer time to bake than do unsweetened egg-milk mixture. The following should help in judging the quality of the finished product:

(1) Whether a baked custard is gelled (done) can be determined by inserting a knife into the center of the custard and withdrawing it. If the custard is gelled, no custard should cling to the knife.

(2) When the yolk of a hard cooked egg is discolored by the formation of a green ring, the discoloration is caused by either failure to properly cool or by an egg that has deteriorated through age and careless handling. Eggs cooked in the shell should be simmered, never boiled. Upon completion of the cooking period, drain and cover with cold water to stop the cooking process to insure ease of peeling and to prevent the formation of the green ring.

(3) The protein of the egg becomes toughened by high heat.

SECTION VIII

DESSERTS

33. CAKES. Batter-type cakes are made from mixtures of flour and liquid in various proportions. Other ingredients are added for tenderness, texture, flavor, color, and food value. Batter cakes, which all contain fat, include pound cakes, or loaf cakes, plain cakes, or basic-type, and chocolate cakes such as devil's food. Sponge cakes which contain no fat are made by using whole eggs or egg yolks for foam. Cake mixes are used extensively in Army dining facilities.

a. METHODS OF PREPARATION. Each type of cake requires a specific method of preparation. The standard recipes in Armed Forces Recipe Service list the quantities of ingredients to be used in making 100 portions and gives the step-by-step procedures for combining the ingredients to produce the desired results. The standard recipe for yellow cake is shown in figure 19.

b. SUGGESTIONS FOR CONTROL OF QUALITY. Figure 20 shows the guidelines for successful cake baking, and figure 21 shows guidelines for using cake mixes. These guidelines from Armed Forces Recipe Service should be followed to control the quality of the finished products. The baking of a cake involves a complicated series of chemical and physical changes. Each ingredient and every manipulation contributes at least one characteristic to the finished product. Some of the recipes for different types of cakes vary slightly, because it has been found that certain ingredients will produce a better product if different mixing and baking techniques are used. Some additional precautions to be observed in controlling the quality of the finished product are:

(1) If the batter is thick, quickly swirl out from the center of the cake pen with a spatula or scraper so the batter is slightly higher at the edges than at the middle. This procedure tends to produce a level layer instead of one that is higher at the center.

(2) Do not allow the pans to touch each other or to touch the oven walls.

(3) Do not place one pan directly above another in the oven.

c. JUDGING THE QUALITY. The characteristics of good-quality and poor-quality batter-type cakes, from Armed Forces Recipe Service, are shown in table 8.

34. FILLINGS AND FROSTINGS FOR CAKES. TM 10-412 gives the recipes for various fillings and frostings for layer and sheet cakes. The daily menu usually specifies the type to be served for a particular meal. Figure 22 gives guidelines for preparing frostings, and figure 23 gives guidelines for frosting cakes.

35. PASTRY AND PIES. Section I of Armed Forces Recipe Service contains recipes for various types of pies. A good pie has a crisp, tender crust and a sweet, flavorful filling of a proper consistency. Pies may be single or double crust type. Usually the filling is placed

YELLOW CAKE G. DESSERTS (CAKES, FILLINGS AND FROSTINGS) No. 32(2)

YIELD: 100 Portions (2 Pans)					EACH PORTION: 1 Piece
PAN SIZE: 18 by 26-inch Sheet Pan					TEMPERATURE: 375° F. Oven
PER CENT	INGREDIENTS	WEIGHTS	MEASURES		METHOD
25.50	Flour, wheat, soft, sifted	4 lb	4½ qt		1. Sift together flour, sugar, salt, baking powder and milk into mixer bowl.
25.50	Sugar, granulated	4 lb	2¼ qt		
.60	Salt	1½ oz	2¼ tbsp		
.99	Baking powder	2½ oz	5½ tbsp		
2.39	Milk, nonfat, dry	6 oz	1⅓ cups		
11.95	Shortening	1 lb 14 oz	4¼ cups		2. Add shortening and water to flour-sugar mixture. Using beater, beat 1 minute at low speed until blended; continue beating for 2 minutes at medium speed. Scrape down bowl.
14.74	Water	2 lb 5 oz	4⅔ cups		
12.75	Eggs, whole	2 lb	1 qt (20 eggs)		3. Combine eggs, water and vanilla. Add slowly to creamed mixture while beating at low speed. Scrape down bowl. Beat 3 minutes at medium speed.
4.78	Water	12 oz	1½ cups		
.80	Vanilla	2 oz	4 tbsp		
100.00		15 lb 11 oz			4. Pour 4 qt (7 lb 10 oz) batter into each greased and floured pan.
					5. Bake 30 to 35 minutes.
					6. Cut each pan 6 by 9.

NOTE: Evaporated milk may be substituted for the nonfat dry milk. In Step 2, use 1 lb 12 oz (1 qt) shortening, 1⅔ cups water and 2 lb (3⅔ cups) evaporated milk.

Figure 19. Standard recipe from Armed Forms Recipe Service for yellow cake.

GUIDELINES FOR SUCCESSFUL CAKE BAKING

A. Read through entire recipe card.
B. Assemble all utensils and baking pans.
C. Set oven thermostat to temperature specified in recipe. Check to make sure oven racks are level and in proper position for baking.
D. Assemble all ingredients. Use exact ingredients specified in recipe.

1. PREPARATION OF CAKE PANS:
   a. Do not use warped or bent baking pans. Use only lightweight sheet pans (weighing about 4 lb) designed for baking.
   b. Prepare pans for baking. If cakes are to be served directly from pans, grease pans with shortening and dust with flour or spread with Pan Coating (Recipe Card G-36). If cakes are to be removed from pans and served as layer cakes or as jelly roll, grease and line pans with paper to ensure easy removal.
2. PREPARATION AND MIXING OF INGREDIENTS:
   a. The temperature of ingredients is very important in cake preparation. Shortening should be workable, neither too cold nor warm enough to liquify. Water should be cool and eggs should be removed from refrigeration 30 minutes before using.
   b. Weigh or measure all ingredients accurately. Follow the mixing procedure stated on the recipe card. Do not overbeat or underbeat. The correct length of time for beating at each stage indicated on the recipe card should be followed very closely.
3. PANNING BATTER:
   a. Pour the amount of batter specified in the recipe into prepared baking pans. (See Recipe Card G-G-5.)
   b. Spread batter evenly using a spatula.
   c. Batter-filled baking pans should be placed immediately into a preheated oven.
4. BAKING:
   a. Space pans evenly in oven to allow heat to circulate around each pan. Pans should not touch each other or sides of oven.
   b. To test for doneness, touch top of cake near the center. If indentation remains, the cake is not done and should be baked 3 to 5 minutes longer and tested again.
   c. When cakes are done they should be lightly browned and beginning to shrink from sides of pans.
5. COOLING AND REMOVING FROM PANS:
   a. Remove baking pans from oven and place on racks away from drafts to cool.
   b. To complete cooling layer cakes, they should be removed from pans onto parchment paper.
   c. Sheet cakes may be cooled in pans and frosted or turned out onto inverted baking pans.
   d. Allow cakes to cool thoroughly before frosting. (See Recipe Card G-G-7.)

Figure 20. Guidelines for successful cake baking from Armed Forces Recipe Service.

GUIDELINES FOR USING CAKE MIXES

1. Read and follow instructions on container.
2. Before you start to mix the cake:
   a. Preheat oven to temperature stated on container.
   b. Assemble utensils and prepare baking pans.
   c. If making a variation of the basic mix, weigh or measure the ingredients to be added to the basic mix.
3. Follow the instructions of the container for mixing the cake. DO NOT UNDERMIX. If using a beater, time beating precisely and use the speeds indicated. If beating by hand, use a vigorous beating stroke.
4. Follow instructions on the container for baking time. Test for doneness according to Guidelines for Successful Cake Baking, Card G-G-1.
5. Cool and then frost according to Guidelines for Frosting Cakes, Card G-G-7.
6. If making a variation of a cake mix—
   a. Chop fruits and nuts finely.
   b. Drain fruit (except applesauce) very well before adding it to the cake mix.
   c. If fruit juice is to be substituted for part of the liquid, add the fruit juice as part of the last addition of the liquid.

Figure 21. Guidelines from Armed Forces Recipe Service for using cake mixes.

CHARACTERISTICS OF GOOD QUALITY	
COLOR	Uniform color, light golden brown crust for white or yellow cake. Crusts of dark cakes may be slightly darker than inside.
SHAPE AND SIZE	Cakes should be slightly rounded on top with even height at sides. Cakes should come to slightly above top of layer or sheet pans.
CRUST	Thin tender crust with slight sheen. Flat bubbles may appear on surface and be slightly darker.
TEXTURE	Breaks easily but does not crumble. Moist but not gummy. Light, velvety, fine to medium walled cells.
FLAVOR	Determined by type of cake. Sweet, no off flavor.
CAUSES FOR POOR QUALITY	
OUTSIDE APPEARANCE	
Peaks	Oven too hot. Not enough liquid. Batter overmixed. Pans too close together or too close to side of oven. Too much flour.
Sag in center	Underbaked. Oven too cool. Too much batter in pan. Too much sugar, shortening, or leavening. Not enough eggs or flour.
COLOR	
Too Dark	Oven too hot. Too much sugar or milk solids.
Too Light	Not enough batter in pan. Overmixed or undermixed. Underbaked.
CRUST	
Too Thick	Oven too hot. Overbaked. Pan too deep. Batter overmixed.
Cracked	Too much flour. Oven too hot. Overmixed.
Sticky	Underbaked. High humidity. Cake placed in pastry cabinet while still warm.
Tough	Overmixed. Oven too cool. Too much flour. Not enough shortening or sugar.
Hard	Overbaked. Pan too deep.
INSIDE APPEARANCE	
Coarse Grain	Overmixed or undermixed. Oven too cool. Too much leavening.
Tunnels	Undermixed or overmixed. Oven too hot.
TEXTURE	
Too Dry	Overbaked. Not enough liquid or shortening. Too much flour or leavening. Omission of eggs.
Crumbly	Not enough shortening. Too much leavening. Oven too cool. Undermixed or overmixed. Not enough eggs.
Tough	Overmixed. Too much or wrong type of flour. Not enough shortening or sugar. Oven too cool.
Too Tender	Batter undermixed.
Too Heavy	Too much shortening. Underbaked.
EXCESSIVE SHRINKAGE	Overmixed. Too much grease in pan. Overbaked. Not enough batter in pan.
OFF FLAVOR	Ingredients not measured accurately. Rancid pan grease. Dirty pan.
HOLLOW SPOT ON BOTTOM	Not enough liquid. Too much flour. Excess bottom heat in oven. Pan not properly prepared.
UNEVENLY BAKED	Undermixed or overmixed. Uneven or dented pan. Not panned properly. Hot or cold spots in oven.
FALLS DURING BAKING	Overmixed. Jarred during baking. Oven too cool.
LACKS VOLUME	Not enough leavening. Not enough batter in pan. Oven too hot or too cool.
CAKE STICKS TO PAN	Pan not properly prepared. Oven too cool. Cake left in pan too long. Too much liquid. Undermixed.

Table 8. Characteristics of good- and poor-quality batter-type cakes

GUIDELINES FOR PREPARING FROSTINGS

1. Meringue powder may be substituted for egg whites in foam frostings. Follow the directions on the can for reconstitution. Use a volume of powder and water equal to the volume of the unbeaten egg whites specified in the recipe.
2. Temperature is very important in cooked frostings. A candy thermometer should be used, if available. If no thermometer is available the temperature may be tested by dropping a small amount of the mixture into cold water (water test) and checking the hardness of the ball which is formed. A soft ball will be formed when sirup is between 235° and 240° F. Remove mixture from heat when testing for a soft ball.
3. Frostings should not be so strongly flavored that they detract from the flavor of the cake. Frostings should complement the flavor of the cake.
4. If a colored frosting is desired, it is best to mix the food coloring with a small amount of the frosting and then add the colored frosting to the larger amount until the desired color is obtained. Harsh strong colors should never be used except in small amounts for some specific decoration.
5. A butter cream frosting which is too thick can be thinned with a little water or milk before it is used. Care must be taken to add the liquid in very small amounts. Butter cream frosting which is too thin can be thickened by the addition of more powdered sugar. The additional powdered sugar should be mixed into the frosting until the desired consistency is reached.

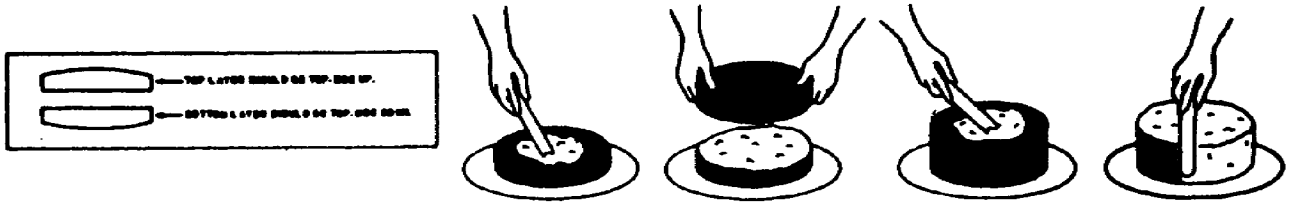
USE OF SHORTENING, BAKERY (EMULSIFIER)

Bakery (emulsifier) shortening may be used in frostings in lieu of butter or margarine in Central Pastry Kitchens. Twelve ounces of the bakery (emulsifier) shortening and 4 ounces of water will replace 1 pound of butter or margarine. The water should be added to the liquid in the recipe and the bakery (emulsifier) shortening used in lieu of the butter or margarine. No change in procedure is necessary.

Figure 22. Guidelines for preparing frostings from Armed Forces Recipe Service.

GUIDELINES FOR FROSTING CAKES

1. **Remove loose crumbs and, if necessary, trim the cake. Use a sharp knife to remove any hard or jagged edges.**
2. **Form layer cakes using two 9-inch layers, or a sheet cake cut in half to form 2 layers or two sheet cakes put together.**
3. **When frosting a layer cake, invert the bottom with the top side down. Place the thicker layer on the bottom. Use a spatula to spread frosting or filling evenly over the bottom layer. Cover with the top layer, top side up. Starting from the center and working outward, spread frosting on the top of the cake; then frost the sides.**



4. **When frosting cupcakes, spread the specified amount of frosting on the top of the cupcake. Do not frost the sides.**

Figure 23. Guidelines for frosting cakes from Armed Forces Recipe Service.

in the crust before baking; however, fillings for chiffon and cream types are placed in prebaked pie shells. Pie fillings are classified into three basic types: Fruit, chiffon, and cream. Fruit fillings consist of fruit or berries, combined with a thickened fruit juice, sugar, salt, and water. The recipes give directions for using cornstarch or pregelatinized starch as a thickening agent. The fruits or berries may be fresh, canned, dehydrated, or frozen. Chiffon fillings, which are light and fluffy, depend on air beaten into the filling for their characteristic texture. Whipped, flavored gelatin and whipped topping are combined to achieve this texture. Cream fillings usually consist of eggs, milk, sugar, and flavoring. Instant dessert powders may be used for making cream fillings. The same basic recipe used to make dough for pie crust is used to make dough for cobblers, dumplings, and turnovers.

a. METHODS OF PREPARATION. Figure 24 shows the directions for making a two-crust pie, from Armed Forces Recipe Service. The filling for any type of pie is prepared in strict compliance with the instructions given in the standard recipe. The topping of meringue, marshmallow meringue, or streusel or dessert topping is used, depending on the type of pie.

DIRECTIONS FOR MAKING A TWO-CRUST PIE

1. **DIVIDE DOUGH:**

   Divide dough into pieces of a size easily handled and place on a lightly floured board. Roll each piece into a cylinder about 3 inches in diameter, handling as little as possible. Cut into 8 ounce pieces for the bottom crust and 7 ounce pieces for the top crust.

2. **ROLL DOUGH:**

   Sprinkle each piece of dough lightly with flour; flatten gently. Using a floured rolling pin, roll lightly from center out to edge, in all directions, forming a circle about 1 inch larger than pie pan and about ⅛ inch thick. Shift or turn dough occasionally to prevent sticking to board.

3. **BOTTOM CRUST:**

   Fold pastry circle in half; lift onto ungreased pie pan, with fold at center; unfold and fit carefully to eliminate air pockets.

4. **FILL CRUST:**

   As specified on individual recipe cards.

5. **TOP CRUST:**

   Roll top crust in the same manner as bottom crust. Fold in half; with knife, make several slits near center fold to allow steam to escape during baking. Brush outer rim of bottom crust with water. Lay top crust over filling, with fold at center, unfold and press edges of two crusts together lightly.

6. **REMOVE EXCESS DOUGH:**

   Trim the overhanging edges of dough by pressing hands against rim of pie pan. There should be little excess dough if skill is used in gauging portions and rolling. Use dough trimmings for bottom crust only.

7. **SEAL PIE:**

   Press edges firmly together or finish crust with a fluted edge. To help prevent juice from overflowing around edges of pie, lift sealed edges of pie with edge of a knife.

8. **GLAZE TOP:**

   If a glazed top is desired, brush top with water, milk, melted butter or Egg and Milk Wash (Recipe Card I-4). Allow glaze to dry on pie before placing it in oven. This eliminates dark spots.

9. **BAKE:**

   Bake at 425° F. about 45 minutes or until crust is nicely browned. The exact time will vary with the filling used in the pie The pie is done when the juice just begins to boil out of the perforations.

Figure 24. Directions for making a two-crust pie from Armed Forces Recipe Service.

b. SUGGESTIONS FOR CONTROL OF QUALITY. Figure 25 shows some hints for successful pie baking. If pies are held for any length of time, they become stale and seem to acquire flavor from the pan. Many fillings of pies are very perishable; therefore, pies should not be made too far in advance. Fruit pies should not be cut while they are hot. Most pies are cut into six servings; they are first cut in half, and then each half is cut into equal thirds. A sharp knife should be used, and the slices should be lifted from the pan to the serving dishes, with a broad spatula.

Hints for Successful Pie Baking

1. It is important to follow the proportions of the basic pie crust recipe exactly. Too much shortening will yield a greasy dough which is soft and difficult to handle. Insufficient shortening or too much flour, salt, or water will yield a tough crust.

2. Temperature is very important in the preparation of pie dough. Cold water (about 40° F.) is desirable. (If ice is available, it may be added to the water.) Dough should not be allowed to stay in a warm room. Refrigerating the dough for a period of time, if possible, is desirable.

3. Dough should be rolled on a slightly floured board. Extra flour should not be rolled into the dough because this will toughen the crust.

4. Dough should never be stretched to fit the pie pan. The dough will go back to its original size during baking and the crust will not be large enough to cover the pan. Bent or warped pie pans should never be used.

5. The top crust of a fruit pie should always be docked by making several small slits near the center of the crust to allow steam to escape while the pie is baking. Single crust pies which are to be baked and then filled should be docked, preferably with the tines of a fork, prior to baking. Single crust pies which are going to be filled and then baked should not be docked because the filling will run through the holes into the bottom of the pan.

6. A cooked filling should never be put into an uncooked crust before the filling is cooled somewhat because the heat of the filling will melt the shortening and toughen the crust.

7. The edge of the bottom crust of a two crust pie is moistened before the top crust is added to help seal the two crusts together and help prevent the filling from leaking out while it is baking.

8. Meringue should touch all of the inside edges of the crust to prevent it pulling away from the sides of the crust while it is baking.

9. The correct baking temperature is very important. If the temperature is too low, the crust will be tough and if the temperature is too high, the crust will brown too quickly and there will be a layer of uncooked dough on the inside of the crust.

10. Dough trimmings should be rolled into a ball and then used for a bottom crust, never a top crust.

Figure 25. Some suggestions for baking pies.

c. JUDGING THE QUALITY. When cut for serving, cream pies should be sufficiently soft to barely hold their shape. The fillings of fruit pies should hold their shape between the crusts, but should not be firm. Crusts should be tender, and the mealiness or flakiness should suit the type of pie. Fruit pieces should be whole and distinct. Table 9 gives causes and remedies for faulty pies.

36. COOKIES. Most cookies are composed of the same basic ingredients as cakes. Different types of cookies are made by varying the proportions of the basic ingredients and the methods of mixing. Soft, cakelike cookies have a higher proportion of liquid and flour; crisp, thin cookies have a higher proportion of sugar and shortening. Figure 26 gives general information regarding cookies, and figure 27 gives guidelines for successful cookie baking.

H-G. DESSERTS (COOKIES) No. 1

GENERAL INFORMATION REGARDING COOKIES

CLASSIFICATION:

1. **A stiff dough generally is formed into a roll, sliced and baked on sheet pans. Care should be taken not to overmix the dough or incorporate extra flour during mixing because this will toughen the cookies. These cookies also can be rolled out and cut into squares, circles, or fancy shapes. The method of forming the dough into a roll and then slicing the roll into uniform pieces saves time and eliminates the problem of leftover dough. It is very important that the roll be uniform and that the slices be of the same thickness to insure the even baking of cookies.**
2. **A soft dough generally is formed into drop cookies. A spoon or pastry bag may be used to drop them onto the sheet pans. Drop cookies should all be the same size to insure even baking.**
3. **A refrigerator dough generally is formed into a roll, wrapped and refrigerated until sliced and baked. It is necessary to refrigerate the dough since it generally is too soft to cut easily unless it has been thoroughly chilled. The dough should not be kept at room temperature any longer than necessary before slicing, to prevent softening and difficulty in handling.**
4. **Bars are baked and then generally cut while warm to avoid breakage. They may be formed from rolls of dough flattened in a sheet pan or from dough spread into a sheet pan before baking.**
5. **Brownies are very rich cookies. The batter is quite heavy and must be smoothed in the sheet pan to insure an even thickness. There are two types of brownies: the heavier, chewy, fudge type or the cake types. The method of mixing determines the type of brownies. They may be frosted if desired.**

Figure 26. General information regarding cookies from Armed Forces Recipe Service.

37. OTHER DESSERTS. Gelatins, puddings, ice cream, and fresh fruits are desserts that are served to blend or contrast with the color, texture, temperature, shape, and flavor of other components of the meal. With a rich and highly seasoned meal, a simple,

mild-flavored dessert is best. Gelatin desserts are light, simple, and colorful. They may vary from plain-flavored gelatin dessert with a topping to a gelatin-fruit mixture or a gelatin-pudding mixture. Puddings may be cooked by baking, boiling, and steaming or may be prepared from instant mixes. The variety of toppings, garnishes, and sauces used with puddings is almost unlimited. They should be chosen to complement the color and flavor of the pudding, to fit the season of the year, or to emphasize a special occasion. The standard recipe for basic ice cream gives instructions for making nine different varieties, using dehydrated ice cream mix. Ice cream procured already frozen contains butterfat, milk solids, sugar, flavoring, and a small amount of gelatin. Ice cream may or may not contain egg. Ingredients are used in proportions according to the standards established by laws. Fruits of all kinds are excellent for dessert. They may be served alone, either with or without sugar, and may be served fresh, stewed, baked, canned, preserved, or frozen. Fruits combine readily with other ingredients to produce fruit whips, soufflés, puddings, fruit tapiocas, ices, sherbets, and ice creams. Section J, Desserts (puddings and other desserts), of Armed Forces Recipe Service contains the recipes for preparing puddings, custards, ice creams, and other desserts. Each recipe must be followed exactly to produce the desired finished product. It is important that these desserts be served at the desired temperatures. Most of them must be served cold to be appealing in form, taste, and texture. The following hints should help in controlling the quality of these desserts:

H-G. DESSERTS (COOKIES) No. 2

GUIDELINES FOR SUCCESSFUL COOKIE BAKING

1. Avoid overbaking cookies. Always test for doneness. Overbaked cookies become dry and lose their flavor rapidly.
2. Most cookies should be loosened from the pans and removed to other pans or racks to cool because they will continue to bake if left on the hot pans and generally will be difficult to remove when they are cool.
3. It is important to follow the instructions in the recipe regarding greasing pans because some cookies require a greased pan for baking but other cookies have enough fat in the dough to eliminate the need for greasing the pan. Heavy greasing encourages spreading of the cookies. Use cool sheet pans because cookie dough will melt and spread too much if a hot sheet pan is used.
4. Make each cookie the same size and thickness and space them evenly on the pan to insure uniform baking. Cookies may be flattened with the bottom of a small can or glass dipped in sugar. Cookies may also be flattened with a fork to make a criss cross design on the top.
5. If cookies are to be cut into special shapes, the dough should be rolled out to ¼ to ½ inch in thickness on a lightly floured board, cut into the desired shapes and baked as directed in the basic recipe. If cookie cutters are not available, an empty can of the desired size may be used. The can should have both ends removed, be thoroughly cleaned and have the edges smoothed before it is used.
6. To cut a roll of cookies evenly, it is suggested that a clean piece of wood or metal be notched, according to the width desired for each cookie, and be used as a guide in making cookie rolls for slicing. A dough scraper should be used to cut the roll of cookie dough; however, a sharp knife is best for cutting refrigerator cookies.
7. If less than a full pan of cookies is to be baked, the cookies should be spaced evenly in the center of the pan to insure even baking.

Figure 27. Guidelines for successful cookie baking from Armed Forces Recipe Service.

Table 9. Causes and remedies for faulty pies

Nature of Trouble	Possible Causes	Possible Remedies
Excessive shrinkage of crusts..	Not enough shortening....	Increase the shortening.
	Too much water.....	Cut quantity of water.
	Dough worked too much....	Do not overmix.
	Flour too strong.....	Use a weaker flour or increase shortening content.
Crust not flaky.....	Dough mixed too warm.....	Have water cold.
	Shortening too soft.....	Have shortening at right temperature.
	Rubbing flour and fat too much.....	Do not rub too much.
Bottom crust soaks too much juice.....	Insufficient baking.....	Bake longer.
	Crust too rich.....	Reduce amount of shortening.
	Too cool an oven.....	More bottom heat.
Tough crust.....	Flour too strong.....	Increase the shortening.
	Dough overmixed.....	Just incorporate the ingredients.
	Overworking the dough....	Work dough as little as possible.
	Too much water.....	Reduce amount of water.
Soggy crust.....	Not enough bottom heat...	Regulate oven correctly.
	Oven too hot.....	Regulate oven correctly.
	Having filling hot.....	Use only cold fillings.
Fruit boils out.....	Oven too cold.....	Regulate oven temperature.
	Fruit slightly sour.....	Use more sugar.
	No holes in top crust....	Have a few openings in top crust.
	Crust not properly sealed	Seal bottom and top crust on edges.

Nature of Trouble	Possible Causes	Possible Remedies
Custard pies curdle.....	Overbaked.....	Take out of oven as soon as set.
Blisters on pumpkin pies.....	Oven too hot.....	Regulate oven temperature.
	Too long baking.....	Take out of oven as soon as set.
Bleeding of meringue.....	Moisture in egg whites...	Use a stabilizer in the meringue.
	Poor egg whites.....	Check egg whites for body.
	Grease in egg whites.....	Be sure equipment is free from grease.

Table 9. Continued

a. Baked custards should be cooled as soon as they are done to prevent curdling and weeping.

b. Gelatin should be firm, but tender. If gelatin recipes or the directions on the container are followed, the right concentration should be obtained.

c. Melted gelatin may be regelled without a loss in quality.

d. Gelatin should be allowed to set at temperatures of 32° to 45° F. Temperatures lower than 32° F. cause the gelatins to melt more rapidly.

e. If a gelatin mixture does not harden, the gelatin may not have been completely dissolved.

f. The addition of fresh pineapple to a gelatin mixture will keep the gel from setting.

g. Cut fruits used in preparing fruit cups should be covered with orange or lemon juice to retain their color.

h. Gelatin desserts should be placed on the serving line when it is time to serve them.

i. Overcooking darkens the color and dissipates the flavor of cooked fruits.

j. Cantaloupes and muskmelons have their most potent flavor and aroma when they are served at room temperatures.

k. Fresh pineapple is more flavorful when served cool than when ice cold.

38. SAUCES AND TOPPINGS FOR DESSERTS. A dessert sauce is a thickened, flavorful, sweetened liquid. A topping is a sweetened, flavorful mixture which holds its shape. Both dessert sauces and toppings give flavor and moistness to the basic dessert; they should complement the flavor of the basic dessert. A good dessert sauce is smooth and free of lumps; cooked sauces become thicker as they cool. Sauces with an egg, milk, or starch base should be thick enough not to soak into the dessert, but thin enough to flow easily. Whipped toppings are made from cream, evaporated milk, nonfat dry milk, and dehydrated or frozen dessert and bakery toppings. Although most whipped toppings are bland, flavoring, fruits, and spices may be added, if desired. Baked toppings are used instead of frostings on cakes, and instead of meringues on pies.

PROGRAMMED REVIEW

The questions in this programmed review give you a chance to see how well you have learned the material in Lesson 2. The questions are based on the key points covered in the lesson.

Read each item and indicate your choice by circling the appropriate letter. If you do not know, or are not sure, what the answer is, check the paragraph reference that is shown in parentheses right after the item; then go back and study or read once again all of the referenced material and write your answer.

After you have answered all of the items, check your answers with the Solution Sheet at the end of this lesson. If you did not give the right answer to an item, erase it and write the correct solution in the space instead. Then, as a final check, go back and restudy the lesson reference once more to make sure that your answer is the right one.

REQUIREMENT. Exercise 1 through 29 are multiple choice. Each exercise ha only one single-best answer. Indicate your choice by circling the appropriate letters.

A1. How is a canapé base prepared to prevent sogginess? (para 5d)

a. Spread base with a thin layer of cream cheese.

b. Toast base on one side in an oven.

c. Spread base with a thin film of softened butter.

d. Chill base thoroughly before solving spread.

A2. Which of the following suggestions should be used when preparing stuffed eggs for hors d'oeuvres? (para 6b)

a. Stuff eggs just before they are to be served.

b. Stuff eggs and place in a refrigerator to set before covering with a damp cloth.

c. Cover pan in which eggs are to be placed with a towel to prevent slipping.

d. Place eggs in refrigerator and leave uncovered until ready to serve.

A3. Coffee should not be brewed in an iron container because (para 10c(5))

a. the caffeols will not transfer their flavor and aroma to the water in the presence of iron.

b. a chemical reaction with the container will produce a much higher caffeine content in the coffee.

c. a chemical reaction between the tannic acid and the container will make the brew unfit to drink.

d. the container will absorb much of the flavor from the caffeols.

A4. Which one of the following is a true statement concerning measure the food service sergeant should take to control the quality of coffee? (pare 10c(2)

a. Brew coffee in an iron container.

b. Us older stocks first.

c. Store opened coffee in a wooden container.

d. Brew coffee with water at 212° F.

A5. When iced tea is made from powdered instant tea the tea (para 11a)

a. dissolved in hot water end then added to the appropriate amount of cold water.

b. dissolved in cold water before adding it to the appropriate amount of cold water.

c. added to cold water and then stirred.

d. placed in a container and cold water is added to the tea and stirred.

A6. How does very soft water affect the extraction of favor color component from tea? (para 11b(2))

a. It slows down the extraction.

b. It hastens the extraction.

c. It causes the brew to be cloudy and dark.

d. It causes the brew to be devoid of aroma.

A7. Which one of the following is not a step used to prepare a frozen, concentrated fruit juice? (para 13a(2))

a. Thaw the concentrate in the refrigerator to a slush stage.

b. Vigorously mix the water and the concentrate.

c. Add crushed ice and serve.

d. Chill and serve.

A8. What is one of the differences between a yeast dough that is to be used for rolls and one that is to be used for loaves of bread? (para 15)

a. The dough for rolls is usually softer.

b. The dough for rolls is stiffer.

c. The dough for loaves is richer.

d. The dough for loaves requires loaves mixing.

SITUATION. Exercises 9 through 11 pertain to the preparation of hot rolls for 600 persons. Use the recipe shown in figure 6, and convert the recipe by the true percentages method (fig. 9). Recipe conversion table for pounds and ounce is shown in figure 28.

A9. The amount of flour required is (fig 9)

a. 71 lbs. 6 oz.

b. 71 lbs. 12 oz.

c. 71 lbs. 15 3/4 oz.

d. 72 lbs. 1 oz.

A10. The amount of sit required is (fig. 9)

a. 1 lb. 6 oz.

b. 1 lb. 6 oz.

c. 1 lb. 8 oz.

d. 2 lb. 0 oz.

A11. The total weight of the recipe should be (fig. 9)

a. 72 lbs

b. 120 lbs

c. 1308 lbs. 13 3/4 oz.

d. 514 lbs. 7 1/2 oz.

A12. The texture of yet breeds my be too dry if the dough is (table 4)

a. underproofed or doe not contain sufficient shortening.

b. overbaked or contains wrong proportion of ingredient

c. mixed improperly, is overbaked, or does not contain sufficient shortening

d. overproofed, is improperly mixed, or does not contain sufficient water.

A13. One suggestion for controlling the quality of sweet dough is to (para 16b(7))

a. develop the dough until it is elastic.

b. bring the dough from the mixer at 86° F.

c. plan to bake retarded sweet dough just in time to supply hot items for the serving line.

d. start the makeup when the dough is fully developed to obtain longer bend tolerance.

RECIPE CONVERSION

All recipes in this file are designed to produce 100 portions, and the portion size is noted in the upper right corner of each recipe. Since few dining facilities serve exactly 100 men, and, in some instances the acceptable size portion may be smaller or larger, it is often necessary to reduce or increase a recipe. You may adjust the recipe to yield the number of servings needed, or to use the amount of ingredients available, or to produce a specific number of smaller portions. You may pencil in your computations in the blank column on the recipe card.

In the Weights Column on each recipe card, the quantities of items needed are listed as ____ lb____ oz or ____ lb ____ oz. When increasing or decreasing a recipe, the division or multiplication of pounds and ounces is simplified when decimals are used.

To convert the quantities to decimals, use the table:

Weight in Ounces	Decimal of Pound	Weight in Ounces	Decimal of Pound
1	.06	9	.56
2	.13	10	.63
3	.19	11	.69
4 (¼ lb)	.25	12 (¾ lb)	.75
5	.31	13	.81
6	.38	14	.88
7	.44	15	.94
8 (½ lb)	.50	16 (1 lb)	1.00

For example: 1 lb 4 oz is converted to 1.25 lb

To adjust to yield a specific number of servings:

First— Obtain a working factor by dividing the number of servings needed by 100. For example:
348 (servings needed) ÷ 100 = 3.48 Working Factor

Then—Multiply the quantity of each ingredient by the working factor. For example:
1.25 lb (recipe) × 3.48 Working Factor = 4.35 lb (quantity needed)

The part of the pound is converted to ounces by multiplying the decimal by 16. For example:
.35 lb × 16 ounces = 5.60 ounces

After the part of the pound has been converted to ounces, use the following scale to "round off":

.01 to .12 = 0	.68 to .87 = ¾ ounce
.13 to .37 = ¼ ounce	.88 to .99 = 1 ounce
.38 to .67 = ½ ounce	

Thus 5.60 ounces will be "rounded off" to 5½ ounces and 4 lb 5½ ounces will be the quantity needed.

Figure 28. Information from Armed Forces Recipe Service for adjusting the yield of a standard recipe.

A14. What three types of dough formulas are used in making doughnuts? (para 17)

a. Cake dough, glazed dough, and Danish-pastry dough.

b. Danish-pastry dough, cake dough, and commercially prepared mix.

c. Hot-roll dough, cake dough, and commercially prepared mix.

d. Cake dough, yeast-raised sweet dough, and commercially prepared mix.

A15. Stretching doughnut dough tends to cause the dough to (para 17b(3)

a. become more moist and therefore easier to manage.

b. absorb a greater amount of fat during frying.

c. give the cut doughnuts a smooth surface.

d. expand the sugar content and hasten the browning process.

A16. Which one of the following I true of dough for making pizza? (para 18)

a. Fermentation is relatively short.

b. Makeup requires more time then it does for sweet dough.

c. Volume is a factor in fermentation.

d. A rich dough is needed

A17. Kneading the dough about 1 minute produce a biscuit that (para 21b(2)

a. has an eon texture and a smoother crust.

b. browns quickly and stays fresh.

c. has a pale, crumbly crust.

d. is tough and coarse in texture.

A18. How is farina prepared? (para 28a(1)

a. Mixed with water to make a paste and added to boiling water.

b. Mixed with water to make a paste and added to cold water.

c. Added to cold water, covered tightly, and simmered.

d. Added to boiling water and stirred vigorously.

A19. Which of the following correctly describes the cooking of rice? (para 28a(3))

a. Rice is added to boiling water, covered, and boiled until done.

b. Rice is added to cold water, left uncovered, and boiled until done.

c. Rice is added to cold water, brought to a boil, covered, and simmered until done.

d. Rice is added to boiling water, left uncovered, and boiled until done.

A20. Eggs add to the flavor of starch pudding and (para 30b(6))

a. cause the starch to continue to break down.

b. increase the digestibility.

c. generally make the finished product thinner.

d. generally give additional thickness.

A21. How does mold on the surface of natural bulk cheese affect the quality of the remaining cheese? (fig. 16)

a. Makes it rancid.

b. Cause it to be dry and crumbly.

c. Does not make it harmful.

d. Cause it to be unfit for human consumption.

A22. Cheese that is overcooked is (para 31c)

a. tough and stringy.

b. soft and pliable in consistency.

c. hard and lumpy.

d. brown and tough.

A23. Which one of the following is true for egg whites that are to be beaten and used as the leavening agent for a sponge cake? (fig. 18)

a. The eggs should be removed from the refrigerator 2 hours before use.

b. The eggs should be refrigerated until they are to be used.

c. The eggs should be at room temperature.

d. The egg should be removed from the refrigerator 1 hour before use.

A24. Why would the yolk of a boiled egg become discolored? (para 32d(2)

a. Egg was removed from refrigerator too long before cooking.

b. Egg was not properly cooled upon completion of cooking period.

c. Egg was boiled vigorously.

d. Egg shell is brown and yolk is darker.

A25. When a cake taken from the oven has a sag in the center, what is the cause for the inferior quality? (para 33a & c, table 8)

a. The oven was too hot.

b. The cake was underbaked.

c. Insufficient sugar and shortening were used.

d. Too many egg were used.

A26. If fruit juice is used as part of the liquid for a cake prepared from a cake mix, the juice is added (fig. 21, para 6c)

a. to the egg mixture.

b. after the egg mixture.

c. as the first addition of liquid.

d. as the last addition of liquid.

A27. What is the cause of excessive shrinkage in cake? (para 33b, table 8)

a. Undermixed ingredients.

b. Underbaked cake.

c. Not enough grease in pan.

d. Not enough batter in pan.

A28. What are the guideline for frosting a two-layer cake? (fig. 23, step 3)

a. Place the first layer top side down, and spread with frosting; place the top layer top side up, and frost the top and then the sides.

b. Place the first layer top side down, and spread with frosting; place the top layer top side up, and frost the sides and then top.

c. Place the thinner layer on the bottom, and spread with frosting; place the thicker layer top side up, and frost the top and then the side.

d. Place the thicker layer on the bottom, and spread with frosting; place the thinner layer top side up, and frost the sides and then the top.

A29. Excel pie dough which is trimmed from the rim of a pie pan, may be (fig. 24, step 6)

a. used to make the top crust.

b. used to make another bottom crust.

c. discarded because it will be tough if re-rolled.

d. refrigerated for use at a later time.

REQUIREMENT. Exercises 30 through 32 are matching exercises. Column I contains some food items that are made from batter or dough. Column II lists types of batter and dough. Select the type of batter or dough in column II from which the item in column I is made, and indicate each answer by writing the column II letter below the column I number. Each type of dough or batter in column II may be used once, more than once, or not at all.

	Column I		Column II
A30.	Muffins. (para 20a(2))	a.	Pour batter.
		b.	Drop batter.
A31.	Biscuits. (para 20b)	c.	Soft dough.
A32.	Cornbread. (para 23)	d.	Stiff dough.

REQUIREMENT. Exercises 33 through 35 are matching exercises. Column I lists some statements concerning the uses of eggs in cooking. Column II lists the uses. Select the use in column II that is described in column I, and indicate each answer by writing the column II letter below the column I number. Each use may be used once, more than once, or not at all.

	Column I		Column II
A33.	Egg whites, egg yolks, or whole eggs are beaten to form a foam. (para 32a(1))	a.	Emulsifier.
		b.	Binder.
		c.	Interferer.
A34.	Egg whites and sometimes egg yolks are added to prevent crystallization of sugar. (para 32a(2))	d.	Leavener.
A35.	Egg yolks or whole eggs hold together oil and vinegar. (para 32a(3)		

REQUIREMENT. Exercises 36 through 38 are matching exercises. Column I lists some statements concerning the preparation of cookies. Column II lists types of dough and batter. Select the type of dough or batter in column II that is described in column I, and indicate each answer by writing the column II letter below the column I number. Types listed in column II may be used once, more than once, or not at all.

Column I	Column II
A36. Overmixing causes cookies made from this dough or batter to be tough. (fig. 26, step 1)	a. Brownie batter.
	b. Stiff dough.
	c. Soft dough.
A37. This type of dough or batter is usually formed into drops cookies. (fig. 26, step 2)	d. Refrigerator dough.
A38. Two types of cookies, fudge type and cake type, are made from this dough or batter. (fig. 26, step 5)	

REQUIREMENT. Exercises 39 through 50 are true-false. Record each answer by writing a T or an F next to the exercise number.

A39. Coffee urns should be scrubbed daily with steel wool. (fig. 3)

A40. When making iced tea, the tea is steeped in the appropriate amount of brishly boiling water, for 3 to 5 minutes. The cold water is then added to obtain the correct strength. (fig. 4)

A41. When hot cocoa is prepared, the cocoa, salt, and sugar are combined and mixed with cold water, and the paste is simmered 5 minutes so that the starch in the cocoa will be cooked. (para 12a(1))

A42. In most instances, a fruit drink requiring sugar such as lemonade is sweetened with granulated sugar. (para 13a(4))

A43. The temperature of the ingredients affects texture, tenderness, and keeping quality of sweet dough. (para 16c)

A44. Baked eggs are served in the dining facility often, because they can be prepared in advance and left in a warm oven until they are needed on the grin line. (fig. 18, step 2)

A45. Scrambled eggs may lose some of their vitamin A if they are cooked in excess fat. (para 32c(1))

A46. Frostings may be strongly flavored to add to the flavor of a plain cake. (fig. 22, step 3)

A47. Chiffon pie fillings are light and fluffy because air is beaten into the filling to give them their characteristic texture. (para 35)

A48. Most cookies are composed of the same basic ingredients as cakes; crisp thin cookies have a higher proportion of sugar and fat. (para 36)

A49. Cantaloupes and muskmelons should be served ice cold for maximum flavor and aroma. (para 37j)

A50. A fruit sauce is added to a pudding to complement the pudding's flavor. (para 38)

HAVE YOU COMPLETED ALL EXERCISES? DO YOU UNDERSTAND EVERYTHING COVERED? IF SO, TURN TO THE END OF THIS LESSON AND CHECK YOUR ANSWERS AGAINST THE SOLUTIONS.

APPENDIX

REFERENCES

1. Technical Manuals

TM 10410	Bread Baking
TM 10412	Armed Forces Recipe Service

2. Field Manuals

FM 10-25	Preparation and Serving of Food in the Garrison Dining Facility

SOLUTION SHEET

PROGRAMMED REVIEW

A1.	c	A26.	d
A2.	b	A27.	d
A3.	c	A28.	a
A4.	b	A29.	b
A5.	c	A30.	b
A6.	b	A31.	c
A7.	c	A32.	a
A8.	a	A33.	d
A9.	c	A34.	c
A10.	a	A35.	a
A11.	c	A36.	b
A12.	d	A37.	c
A13.	c	A38.	a
A14.	d	A39.	F
A15.	b	A40.	F
A16.	a	A41.	T
A17.	a	A42.	F
A18.	a	A43.	T
A19.	c	A44.	F
A20.	d	A45.	T
A21.	c	A46.	F
A22.	a	A47.	T
A23.	d	A48.	T
A24.	b	A49.	F
A25.	b	A50.	T

LESSON 3 **Credit Hours: 3**

LESSON ASSIGNMENT

SUBJECT	Basic Food Preparation: Heat, Fish, and Poultry.
STUDY ASSIGNMENT	Lemon Text.
SCOPE	Methods of preparing and serving beef, veal, lamb, pork, chicken, turkey, duck, and fish; methods of controlling quality of items in preparation; standards for judging quality of finished product.
OBJECTIVES	As a result of the successful completion of this assignment, you will be able to--

1. List the methods used to prepare and serve
   a. Meat-beef, veal, lamb, and pork.
   b. Poultry-chicken, turkey, end duck.
   c. Fish-finfish and shellfish.
2. List the methods for controlling the quality of the item covered in this lesson.
3. State the standards used in judging the quality of the items covered in this lesson.
4. Identify the types of meat, poultry, and fish served in the dining facility.
5. List the characteristics of beef, veal, lamb, and pork, and differentiate among the four types.
6. State the procedures for using frozen meats to prepare menu items.

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LESSON TEXT

SECTION I

INTRODUCTION

1. GENERAL. All edible meat from beef, veal, pork, and lamb is made up of muscles composed of bundles of lean microscopic fibers held together and surrounded by connective tissue (fig. 1). How much connective tissue is present is related to how tender a cut of meat is and to how many tender cuts can be obtained from a single meat animal (fig. 2). Muscles from the neck, leg, shoulder, and joints are less tender because of dense connective tissue. The rib and loin areas are known a tender arm; they have very little connective tissue. Surrounding each muscle is an outer costing of protective fat. The two basic methods of cooking meat are by dry heat and by moist hat (fig. 3). The method to be used depends on the kind and cut of the meat. Dry-heat methods are generally used to cook meats that have comparatively little connective tissue, and that will readily become tender by cooking. Moist-heat methods are required for cooking meats that have more connective tissue and that are tenderized by long, slow cooking. In general, poultry is cooked by the same method used for cooking meat. The older, tougher birds are best when cooked by moist heat, but the younger birds are more juicy when cooked by dry heat. Finfish and shellfish are tender and can be prepared by a variety of cooking methods. Gravy, often an important part of the meat course, usually accompanies roasts, braised meats, poultry, and some pan-fried meats. Good gravy should have the distinctive flavor of the main dish with which it is served. There are a few meat dishes such as meat loaf which yield little or no juices for making gravy. For these dishes, sauces are substituted for gravy. Many delicate sauces blend well with finfish and shellfish.

2. TYPES OF MEAT, FISH, AND POULTRY. The following types of meat, fish, and poultry are procured by the Army and issued to dining facilities:

a. MEATS. Recipes in Armed Forces Recipe Service cover the preparation of meats, including fresh, variety, prepared, cured or smoked, and canned, meats. Fresh meats are usually boneless, frozen beef, veal, lamb, and pork. Variety meats include liver, heart, brains, and other meats which do not fit the usual classifications of regular meat cuts. All variety meat contribute essentially the same food elements as those found in the muscle moat from the same animal. Liver, an outstanding source of certain vitamins and mineral, is the only variety meat purchased by the Army for issue to dining facilities. Luncheon meat, frankfurters, and sausages of different kinds are examples of prepared, or ready-to-serve, meats. Cured meats such as corn beef have been treated with salt or other curing agents. Ham, bacon, and some dried beef are cured meats that have been treated with smoke, which adds to the keeping qualities and to the flavor of the meat. Some dried beef is cured without smoke. Canned meats include corned beef, slid ham, ham chunks, and beef and gravy.

b. FISH. Finfish are prepared for the market in various ways; however, the Army buys fresh finfish oily a frozen fillets, steaks, and portions. Shellfish are usually issued live in the shell, cooked, or shucked. Frozen, shucked oysters, scallops, and clams

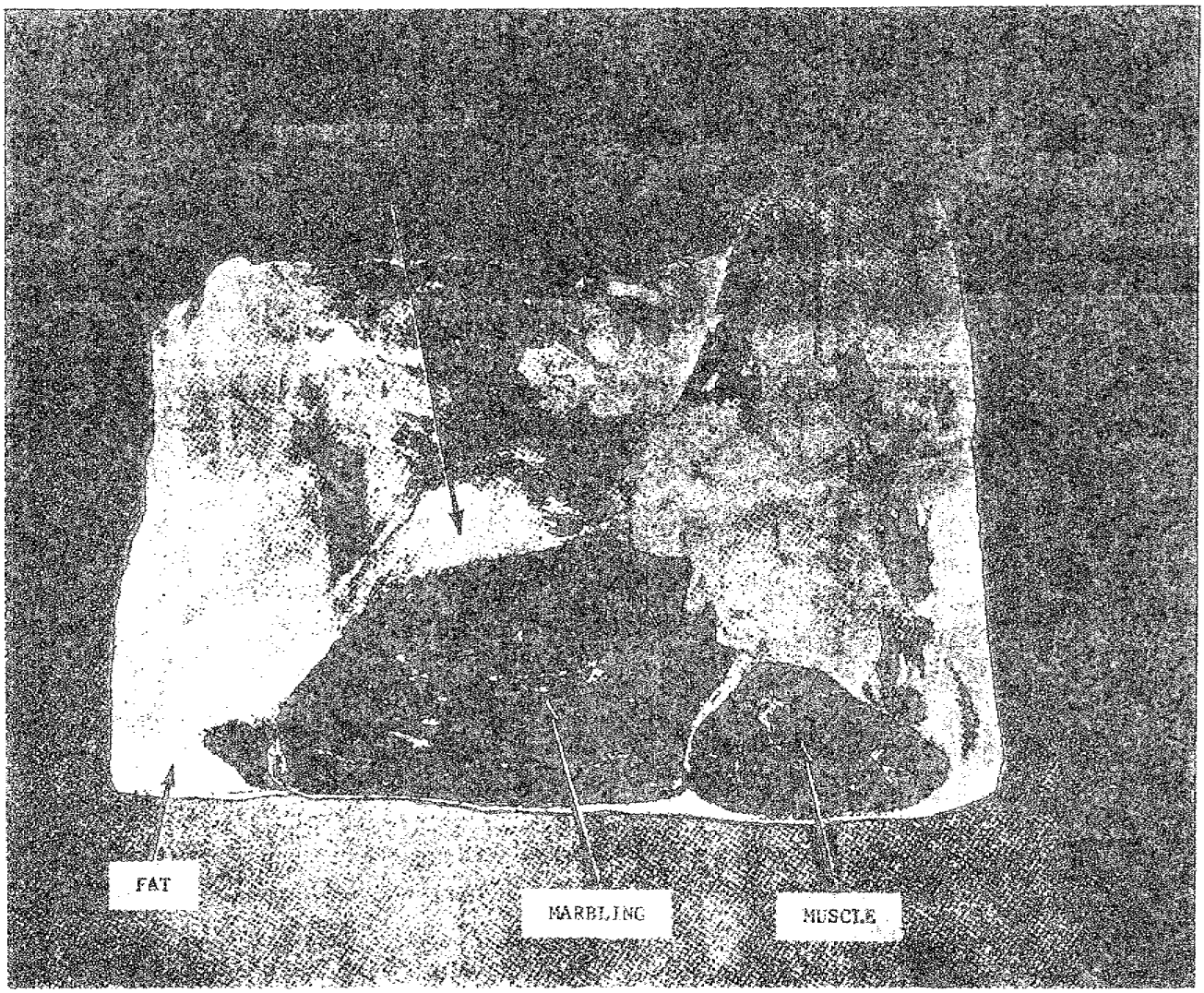


Figure 1. Composition of beef.

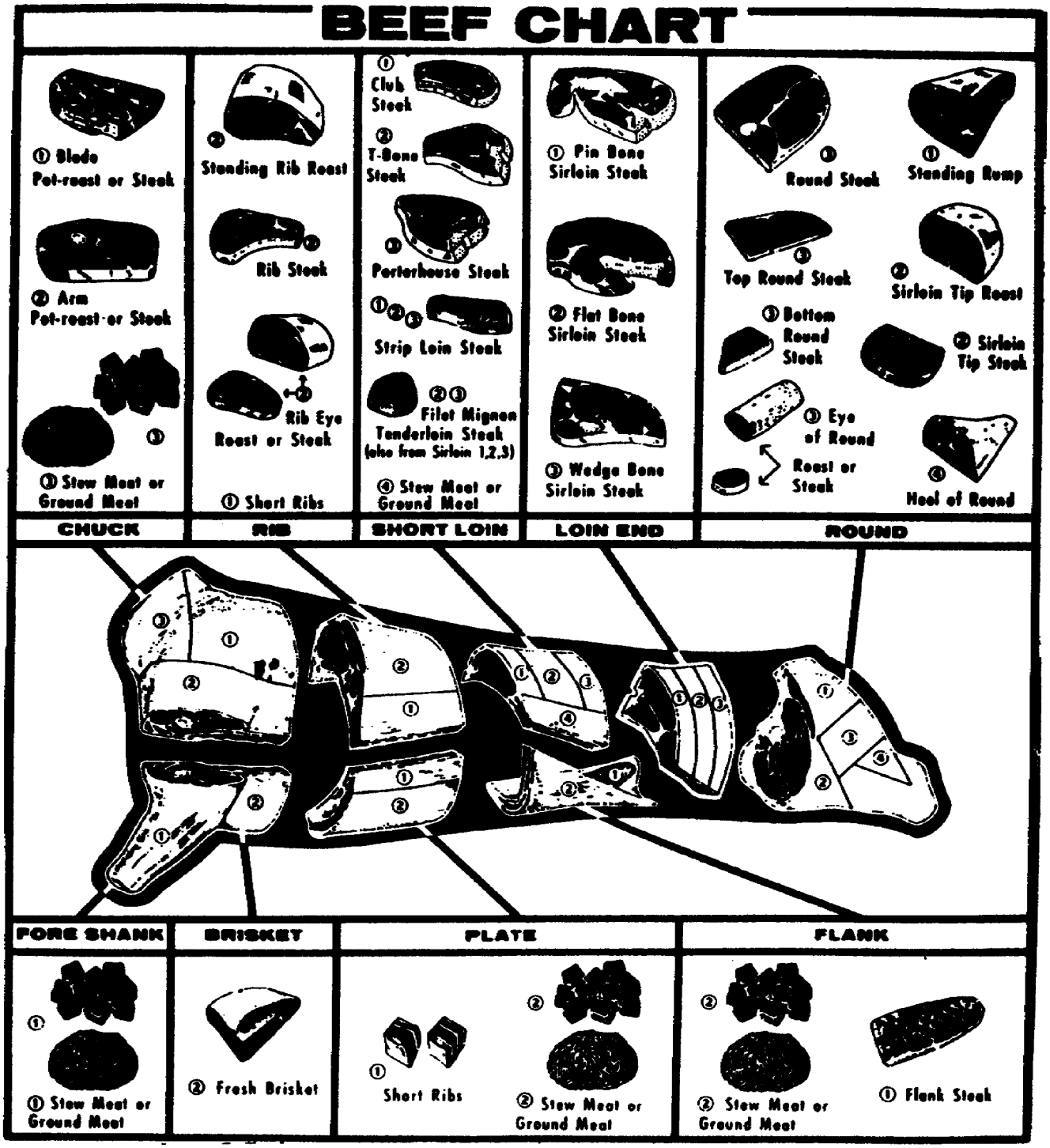


Figure 2. U.S. Department of Agriculture cuts of beef.

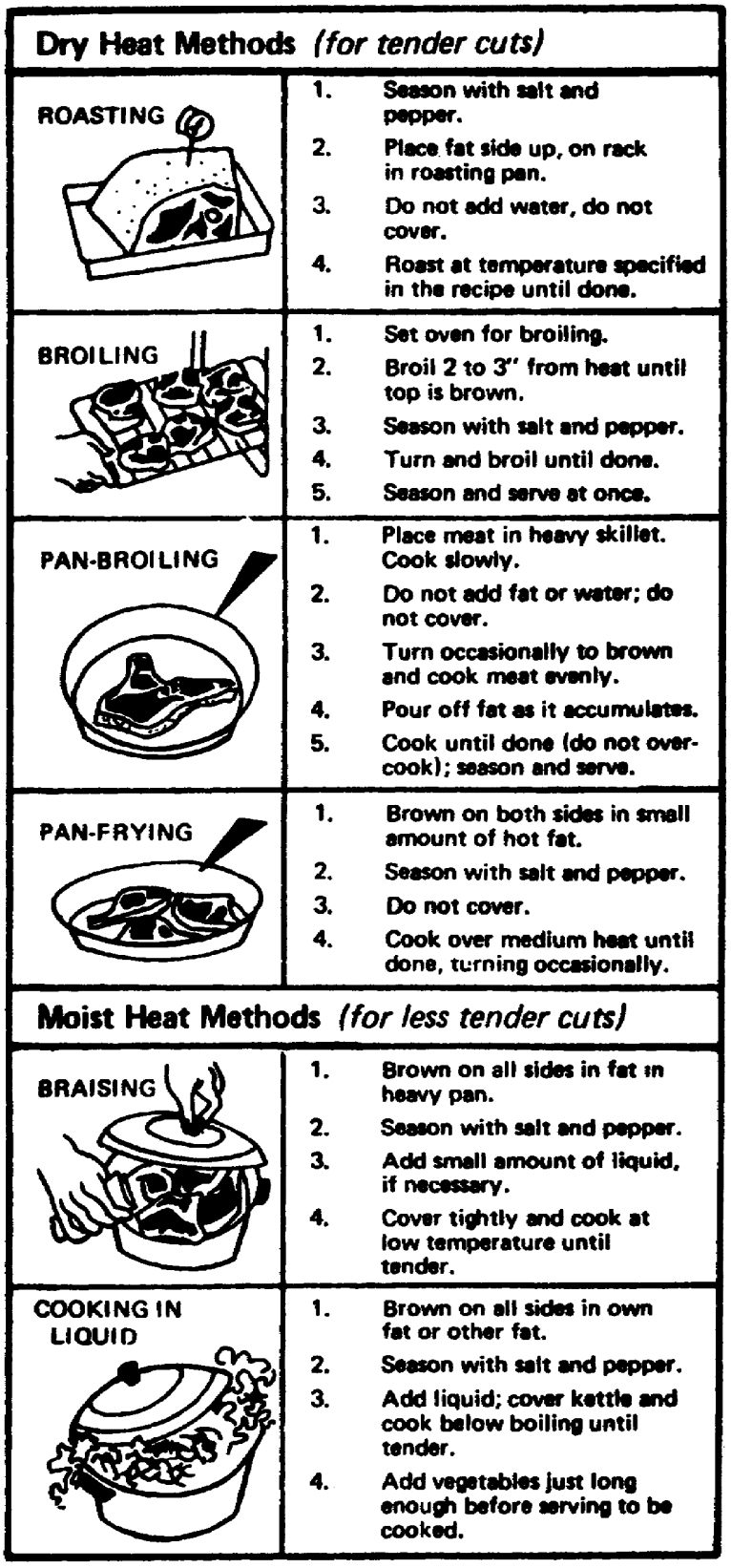

Dry Heat Methods (for tender cuts)
ROASTING
1. Season with salt and pepper.
2. Place fat side up, on rack in roasting pan.
3. Do not add water, do not cover.
4. Roast at temperature specified in the recipe until done.
BROILING
1. Set oven for broiling.
2. Broil 2 to 3" from heat until top is brown.
3. Season with salt and pepper.
4. Turn and broil until done.
5. Season and serve at once.
PAN-BROILING
1. Place meat in heavy skillet. Cook slowly.
2. Do not add fat or water; do not cover.
3. Turn occasionally to brown and cook meat evenly.
4. Pour off fat as it accumulates.
5. Cook until done (do not overcook); season and serve.
PAN-FRYING
1. Brown on both sides in small amount of hot fat.
2. Season with salt and pepper.
3. Do not cover.
4. Cook over medium heat until done, turning occasionally.
Moist Heat Methods (for less tender cuts)
BRAISING
1. Brown on all sides in fat in heavy pan.
2. Season with salt and pepper.
3. Add small amount of liquid, if necessary.
4. Cover tightly and cook at low temperature until tender.
COOKING IN LIQUID
1. Brown on all sides in own fat or other fat.
2. Season with salt and pepper.
3. Add liquid; cover kettle and cook below boiling until tender.
4. Add vegetables just long enough before serving to be cooked.

Figure 3. Dry-heat and moist-heat methods of cooking meats.

and raw, peeled shrimp are used for most of the shellfish recipes. Shrimp are also issued in the frozen, raw unpeeled, frozen breaded, and frozen molded-and-breaded forms. Cooked, dehydrated shrimp are reconstituted for some of the recipes. Canned fish issued to dining facilities include salmon and tuna.

c. POULTRY. Chicken, duck, and turkey are the types of poultry issued to dining facilities. They are usually frozen, either whole or cut up. In addition, boneless, raw (frozen) or cooked turkey are used. Canned, boned chicken or turkey are available for making a number of salads, pot pies, and casseroles. Cooked, sliced, dehydrated chicken pieces are available in cans and packages.

3. COOKING FROZEN AND THAWED MEATS. Thawed meats (including fish and poultry) and frozen meats that are cooked without first being thawed are prepared exactly as chilled meats are prepared. The principle of using low temperatures for cooking raw meats is equally applicable to frozen meats; only the length of cooking time varies. Roasts in the frozen state require about one-third to one-half additional cooking time. Ground and diced meat must be thawed completely before cooking. Ground meats used for hamburger and other meat dishes require shaping before they are cooked, and diced meats for stews need to be browned before they are stewed. Beef steaks. veal steaks and slices, lamb chops and pork slices must be thawed before they are grilled to insure complete doneness. Additional time must be allowed for grilling frozen meat if the grill is on the serving line, because cooking the meat would otherwise slow up the line considerably. Most fish and poultry are completely thawed before they are prepared for cooking. The following facts should be taken into consideration when thawing meats:

a. Frozen meat should be refrigerator thawed before it is cooked to reduce both time and heavy-drip losses during preparation.

b. Once thawed, meat should not be refrozen.

c. Meats should be thawed slowly to yield a juicier, more palatable finished product.

d. Long exposure of the moist surface of thawing meat to open air should be avoided. Uncovered meat surfaces are conducive to bacterial growth.

e. The insertion of the meat thermometer in roasts can be delayed until the roasts are partially thawed if they are to be cooked in the frozen state.

f. All moisture should be wiped from meat that is to be broiled to insure that the meat is cooked by dry heat. Meat that is to be browned should also be dry to insure a quick browning process.

SECTION II

MEAT

4. GENERAL. Meat is cooked to destroy any pathogenic organisms present and to make it more tender and more palatable. Some basic facts pertaining to the preparation of beef, veal, pork, and lamb are listed below.

a. COOKING MEATS. The following information should help in controlling the quality of cooked meats:

(1) Fat acts as an insulator. Under 325° F. oven heat, fat is the first part to break down and melt. This gives a self basting effect to the roast, making it more juicy and tasteful as the fat covering contains most of the taste and flavor.

(2) Heavy rims of fat on meat that is to be broiled or fried should be cut off. Removing the fat prevents curling and allows the meat to cook uniformly and to brown evenly.

(3) A flat roast cooks in less time than a chunky one of the same weight, because the distance from the outside to the center of the flat roast is less and the heat penetrates more quickly.

(4) The minerals in meat are not destroyed in cooking; the method of preparation affects the mineral value of meat only if drip losses are excessive or if the cooking water is discarded.

(5) The yield of calcium from bones may be increased if tomatoes or other acids are added to the meat while it is simmering.

(6) The amount of fat on meat may alter the cooking time. Melted fat readily conducts heat, which results in faster cooking; therefore, a rack should be used for roasting to prevent frying in the fat.

(7) Meat should be placed in the roasting pan with the fat side up. As the fat melts, it bastes the meat and keeps it from drying out.

(8) A roast should be removed from the oven before it reaches the desired temperature because the meat will have an internal temperature increase of 5-8 degrees after removal from the oven. The roast should set approximately 20 minutes before carving.

b. SLICING MEATS. Meats should be sliced across the grain; cross-grain slicing shortens the meat fibers and gives neat slices. A general rule to follow is to slice parallel to the cut surface, because meats used for roasts are usually cut across the grain at the meat process plant. The following information should help to obtain eye-appealing slices of meat:

(1) A slicing machine set at the proper cycle can do a fast carving job; the grain of the meat must be considered to obtain whole, even slices.

(2) Several boneless roasts or hams can be sliced at the same time on a slicing machine if they are properly placed on the carriage.

(3) Strings and skewers should be removed from roasts or hams before machine slicing.

(4) Once one slice of meat is cut satisfactorily, it is usually unnecessary to alter the cutting angle for the remaining slices. However, because the grain of corned beef (brisket) runs through the meat in many directions, it is necessary to turn this meat while slicing it to insure cutting across the grain.

(5) Meats carve more easily if allowed a cooling-off period after cooking.

5. CHARACTERISTICS OF BEEF. Beef is the flesh of steers, heifers, cows, and bulls; it is composed of muscle fibers, connective tissue, and fatty tissue. Connective tissue is of two types, collagen and elastin. In the presence of water, collagen is converted to gelatin. Cooking does not alter the structure or the physical properties of elastin fibers. The relative tenderness of beef depends in part upon the kind, amount, and distribution of connective tissue. Cuts of beef which are high in connective tissue are cooked by moist-heat methods. The amount and disposition of fat in beef depend upon a number of factors such as the species, breed, age, sex, inheritance, and degree of finish of the animal. Fat is found in the connective tissue between the fiber and muscle bundles, and within and between the muscle cells. The disposition of fat, known as marbling, increases the nutritive value of meat, enhances the palatability by helping to retain the meat juices, adds to the flavor of the lean, and tends to keep the beef moist during cooking. The quality of the cooked beef is largely determined by such palatability factors as tenderness, flavor, aroma, juiciness, color, and cooking methods. Tenderness, like fat, is dependent upon the factors of breed, sex, age, inheritance, and degree of finish as well as the kind of feed, system of feeding, and connective-tissue content. Beef cattle usually yield a higher percentage and higher quality of edible meat than do dairy cattle. Grading takes into consideration the age and the sex differences of the animals; the U.S. Department of Agriculture provides accredited graders to do Government grading. In general, beef from older animals is less tender than that from younger ones, but meat from more mature animals is usually more flavorful. The flavor of cooked meat is closely associated with aroma and is believed to be derived from the muscle-fiber proteins. Juiciness and tenderness are closely related; the method of cooking that retains the fluids and fats of the beef produces the juiciest finished product. Color and flavor of beef increase with the age of the animal.

6. CUTS OF BEEF. Usually, completely boned beef comprising the six categories shown in figure 4 is issued to the dining facility. These cuts, known as the six-way beef categories, are obtained from carcass beef or from wholesale cuts of steers or heifers, which are cut, trimmed, and portioned according to the requirements of the procurement specifications. Each category of beef is packaged separately in units of about 50 pounds. The beef is received in the frozen state, ready to cook except for thawing. It is thawed slowly at reefer temperatures (36° to 38° F.) until almost completely thawed. The thawing period varies according to the size of the meat cut (the larger the size, the longer the time required), the air temperature and circulation in the chill space (moving air accelerates thawing), and the quantity of meat being thawed in a given area. The portions and cuts of this six-way beef are shown in figure 5. Grilled steaks and oven roasts are cooked by dry-heat methods. Pot roasts, swiss steaks, and diced beef are braised (cooked by moist-heat methods); ground beef is baked, grilled, or braised. In addition to the six-way beef, frozen beef liver, corned beef, and dried beef are issued for the preparation of the daily menus.

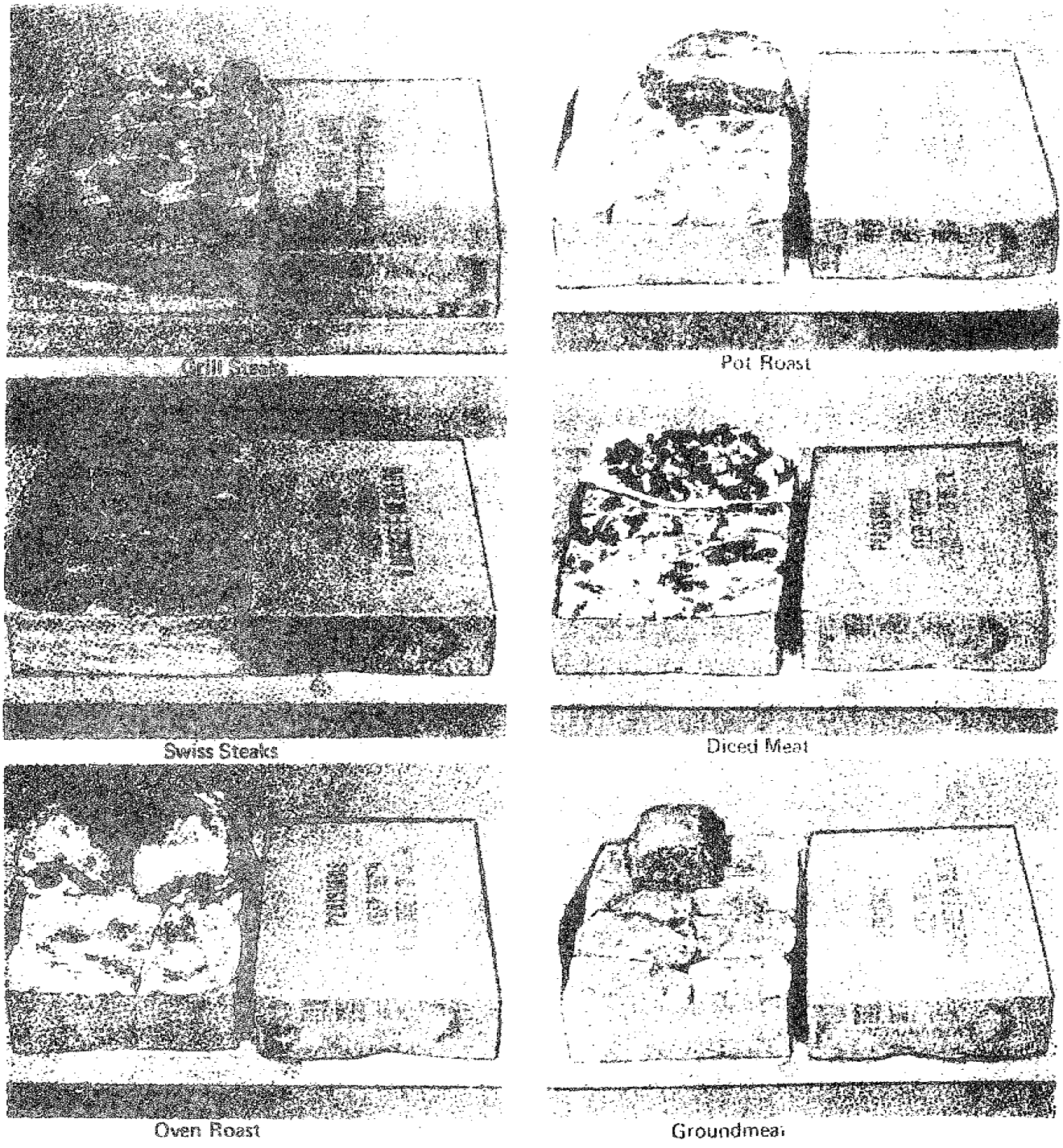


Figure 4. Packaged six-way beef issued to dining facilities.

Category	Description of Cut
Portion-cut grill steaks	Weight: 6 1/4 to 7 1/2 oz. Includes rib eye, loin strip, sirloin butt, tenderloin cuts.
Oven roasts	Includes top round, knuckle, sirloin rump, eye of round.
Portion-cut swiss steaks	Weight: 5 1/4 to 6 3/4-oz. Steaks, mechanically tenderized, whole units of less-tender cuts.
Pot roasts	Includes clod, chuck roll, brisket, heel, plus other cuts.
Diced meat	Each piece measures no more than 3 in. nor less than 1/2 in. along longest surface and weighs 2 oz. maximum (with a 10 percent deviation allowance per lot).
Ground meat	Fat content: A single lot may contain up to 25.0 percent by analysis, provided that the average for the contract (on weight basis) does not exceed 22.0 percent fat by analysis.

Figure 5. Cuts and portions of six-way-beef categories.

7. PREPARING BEEF. Armed Forces Recipe Service contains recipes for cooking beef by dry heat and by moist heat. Each recipe gives specific instructions for preparing the meat and accompaniments. Beef is roasted, grilled, pan-broiled, braised, or cooked in water. Beef liver is breaded and deep-fat fried.

8. ROASTING BEEF. Many of the meat dishes served in the dining facility are cooked by roasting, a dry-heat method. Boneless, oven-roast beef is roasted at low temperature for 2 to 4 hours, depending on the size of the roasts. Meat loaf, salisbury steak, arid corned-beef hash are prepared according to the instructions in the recipe and are baked without a cover on the pan and without additional liquids.

a. SUGGESTIONS FOR CONTROL OF QUALITY. Each beef dish must be carefully prepared as outlined in the recipe to become an acceptable finished product. Care must be taken when roasting beef to insure that the moisture loss and breakdown of the surface fat are not prolonged, causing the surface to become hard and dry. Roasts and meat loaves should not be overcrowded in the pans. They should be cooked far enough in advance to allow them to cool somewhat before they are sliced.

b. JUDGING THE QUALITY. Listed below are some suggestions that should help in judging the quality of the finished product:

(1) The finished product should be juicy and tender and should be cooked to the center to the desired degree of doneness.

(2) A well-browned roast is usually more flavorful than one that is not.

(3) Meat loaves crack (fig. 6) if vegetables such as onions, celery, and peppers are not chopped finely.

(4) Roasts cooked at too high a temperature produce more drippings and less meat (fig. 7).

(5) Standards for doneness of roast beef are as follows:

Rare:	Center, a bright rose red, shading into lighter pink toward the outer portions, changing into dark gray in layer underlying outer browned crust; juice, a bright red; internal temperature, 140° F.
Medium rare:	Center and most slices, a light pink; gray layer underlying crust extends a little toward the center; juice, a light pink; internal temperature, 160° F.
Well done:	Interior, a brownish gray; juice, either colorless or slightly yellow; internal temperature, 170° F.

A. Onion and celery too large, or insufficient moisture

B. Fat not drained during cooking

C. Properly cooked

Figure 6. Baked meat loaf

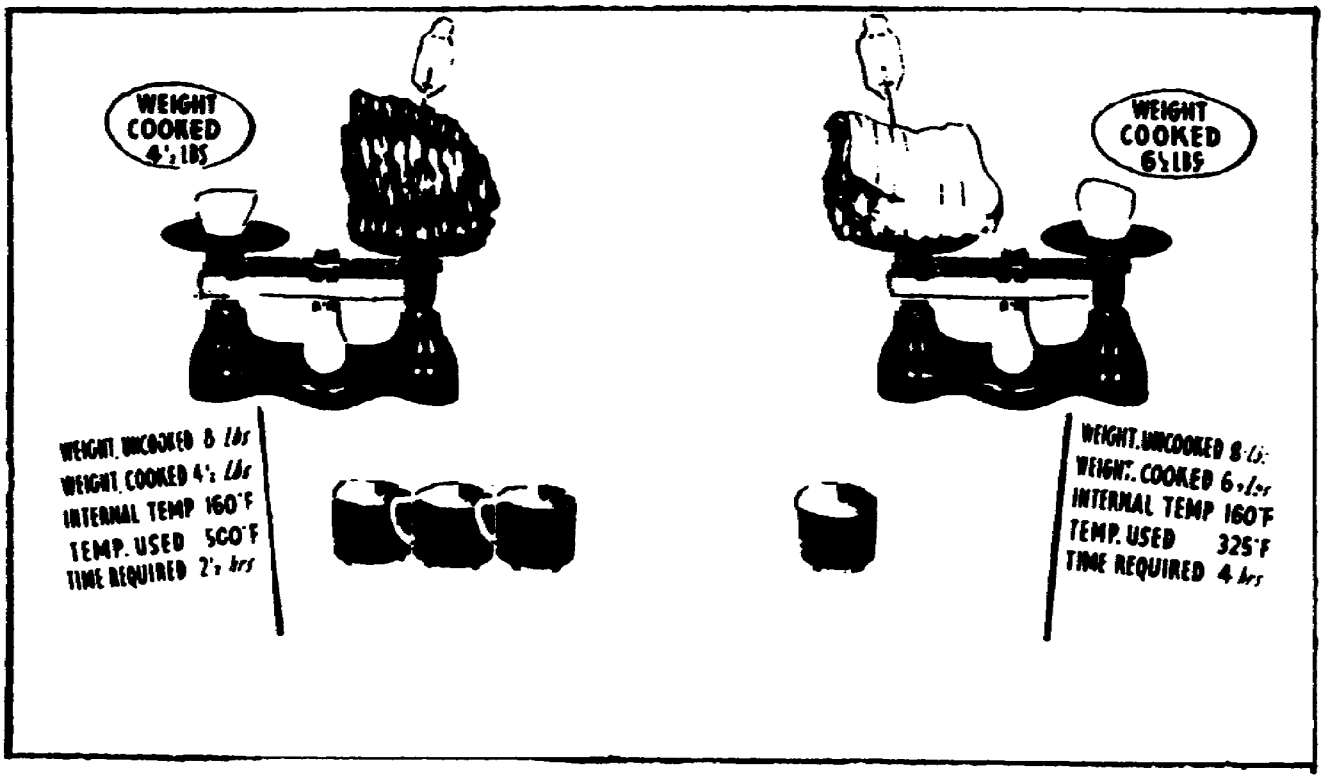


Figure 7. Comparative results of cooking meats at different temperatures.

9. COOKING BEEF BY OTHER DRY-HEAT METHODS. Broiling is classified as a dry-heat method of cooking as are pan broiling and deep-fat frying. In broiling, the heat is applied directly to the meat surface by placing the meat under a gas flame or an electric heating unit or by placing it directly on a heated griddle without added fat. In Army dining facilities, meat is griddle broiled (grilled). Tender cuts of beef are issued for grilling in preparing such dishes as broiled steak, teriyaki steak, or sukiyaki. Ground beef is used for grilled beefburgers and grilled hamburgers. Pan broiling is cooking meat in a pan or skillet, with no addition of fat or liquid; as fat is rendered during the cooking process, it is poured off. Deep-fat frying is considered a dry-heat method of cooking. The meat is covered with a protective coat of breading material and cooked in a deep layer of fat. Thin strips of beef liver are deep-fat fried.' Each type of dish to be served is prepared as outlined in the appropriate recipe. Recipes, from Armed Forces Recipe Service for grilled beef steak and grilled beefburgers are shown in figure 8.

a. SUGGESTIONS FOR CONTROL OF QUALITY. Have the grill or pan hot before placing the meat on it. Brown the meat on one side, and turn and brown on the other. Use tongs for turning the meat to avoid piercing the meat. Do not allow

YIELD: 100 Portions				EACH PORTION: 1 Steak
PAN SIZE:				TEMPERATURE: 400° F. Griddle
INGREDIENTS	WEIGHTS	MEASURES		METHOD
Beef, boneless, grill steaks	50 lb	100 steaks		1. Cut fat edge of each steak in several places to prevent steaks from curling.
Shortening, melted		variable		2. Lightly grease griddle.
				3. Grill steaks on each side to desired degree of doneness: Rare—2½ to 3 minutes; Medium—4 to 5 minutes; Well done—6 to 8 minutes.
Salt		variable		4. Season browned side of steak.
Pepper, black		variable		

NOTE: 73 lb beef, carcass, chilled A.P. will yield 50 lb beef, boneless.

VARIATION

1. PAN-BROILED STEAK: Lightly grease roasting pans (18 by 24-inch); heat pans on top of range. Place steaks in pans and cook over moderate heat until brown on each side and to the desired degree of doneness. Season brown side of steaks with salt and pepper.

Figure 8. Grilled-beef recipes.

fat to accumulate on the grill or in the pan; broiling or grilling requires no fat. Cook the meat at a moderate temperature to make the meat juicier. When the meat is turned over to cook the opposite side, season the browned side immediately.

b. JUDGING THE QUALITY. Steaks should be brown -on the outside and should be cooked to the desired doneness on the inside. The meat should be reddish pink for rare, light pink for medium, and gray or brown for well done.

10. BRAISING BEEF. Braising is a moist-heat method of cooking in which a very small amount of liquid is used to complete the cooking after the meat has browned slowly. Extra liquid may be added for braising, or the braising may be done by the steam from the meat while the pan is tightly covered. Types of meat dishes that are cooked by braising include pot roasts (fig. 9 and 10), chicken-fried steak, pepper steak, swiss steak, spanish steak, barbecued beef, and beef paprika. The liquid used in braising may be water; meat stock, tomatoes, tomato juice, pureed tomatoes, diluted vinegar, or juice from the meat itself. When water is used, it is added in very small quantities, as needed. Some dishes may be cooked without additional liquid, in a tightly covered Dutch-oven-type pan. The steam from the meat juices collects as liquid inside the lid and drops back to the bottom of pan.

a. SUGGESTIONS FOR CONTROLLING THE QUALITY. Insure that the meat is well browned so that the finished product is a luscious brown color. The long, slow cooking in moist heat dissolves the color, unless it is well browned beforehand. Some of the flavor of the meat is lost to the liquid, which is used to make gravy or sauce served with. the meat. The cooking temperature should be low (never above simmering) to soften the connective tissue. In some cases, the meat should be scored or pounded as in the case of swiss steak before it is cooked, to break the tough connective tissue and make a shorter cooking time possible. The following precautions should help to insure a better finished product:

(1) If sautéed onions are to be added, do not overbrown them.

(2) Do not overcook the meat, or it will crumble when served. Do not overcook vegetables to be added to the beef.

(3) Add water or stock in small amounts if the liquid evaporates.

(4) Uniformly cut the vegetables to be added to the meat so they will cool; evenly.

(5) If a roux is used to thicken gravy, cook it at least 5 minutes so it will not have a raw flour taste.

(6) When adding sour cream to the hot liquid, add it slowly and stir constantly. If possible allow the liquid to cool somewhat before adding the sour cream.

BEEF POT ROAST

(oven method)

YIELD: 100 Portions (4 Pans) — EACH PORTION: 2 Slices (4½ Ounces)

PAN SIZE: 18 by 24-inch Roasting Pan — TEMPERATURE: 425° F. Oven; 325° F. Oven

INGREDIENTS	WEIGHTS	MEASURES		METHOD
Shortening, melted	1 lb	2 cups		1. Heat shortening in roasting pans in 425° F. oven or on top of range; add beef and brown on all sides, turning frequently.
Beef, boneless, pot roast	40 lb			
Monosodium glutamate (optional)	3 oz	½ cup		2. Sprinkle an equal amount of seasonings over roast in each pan.
Pepper, black		2 tbsp		
Salt	6 oz	9 tbsp		
Garlic, dry, chopped (optional)		2 tsp (2 cloves)		3. Add an equal amount of garlic, onions, and stock to roasts in each pan. Cover pans.
Onions, dry, chopped	3 lb	2¼ qt		4. Cook at 325° F. 3 to 4 hours or until tender. Turn roast 2 or 3 times during cooking. Add small amounts of water as required.
Stock or water, hot		2 qt		5. Let stand 20 minutes before slicing.

NOTE: 1. 6 oz dehydrated onions may be used in Step 3. Rehydrate according to instructions on Recipe Card A–11. Drain before using.
2. Test for doneness: In Step 4, a fork inserted into the roast will withdraw easily if the meat is cooked and tender.
3. ½ tsp dehydrated garlic may be used in Step 3. See Recipe Card A–17.
4. Reserve drippings in Step 5 for Brown Gravy (Recipe Card O–16).

VARIATIONS

1. GINGER POT ROAST: In Step 2, add 6 lb 6 oz (1-No. 10 cn) canned tomatoes, 2 tbsp ground ginger, 1⅓ tsp ground thyme and 3 bay leaves. Reserve drippings in Step 5 for Brown Gravy (Recipe Card O–16).
2. YANKEE POT ROAST: In Step 3, add 2 lb (2 qt) diced fresh carrots, 2 oz chopped fresh parsley, 6 lb 6 oz (1-No. 10 cn) canned tomatoes, 1 tbsp ground allspice, 4 bay leaves, ½ tsp ground thyme; and 1 cup vinegar. Reserve drippings in Step 5 for Brown Gravy (Recipe Card O–16).
3. HOME STYLE POT ROAST: Place roasts in pans. Sprinkle 2 oz (⅓ cup) dehydrated onion soup evenly over roasts. Cover roasts with 12 lb 8 oz (4-No. 3 cyl cn—5¾ qt) canned, condensed cream of mushroom soup. Cover pans. Bake in 350° F. oven for 3½ to 4½ hours or until tender. Serve with mushroom onion gravy.

CH–3

Figure 9. Recipe for beef pot roast (oven method).

BEEF POT ROAST
(steam-jacketed kettle method)

YIELD: 100 Portions				EACH PORTION: 2 Slices (4½ Ounces)
INGREDIENTS	WEIGHTS	MEASURES		METHOD
Shortening Beef, boneless, pot roast	1 lb 40 lb	2¼ cups		1. Melt shortening in steam-jacketed kettle. Add beef; brown well on all sides.
Salt Pepper, black Onions, dry, chopped Garlic, dehydrated Water, hot	6 oz 3 lb 	9 tbsp 2 tbsp 2¼ qt 4 tsp 1 gal		2. Add salt, pepper, onions, garlic, and water to beef. Cover kettle. Simmer 3 to 3½ hours or until beef is tender. Add small amounts of water as required. 3. Remove cooked beef.
Flour, wheat, pastry, sifted Water, cold	1 lb 2 oz 	1¼ qt 2 qt		4. Combine flour and water until smooth; add to stock, stirring constantly. Cook 15 minutes or until slightly thickened. 5. Serve over sliced meat.

NOTE: 1. 6 oz dehydrated onions may be used in Step 2. Rehydrate according to instructions on Recipe Card A–11. Drain before using.

2. Test for doneness: In Step 2, a fork inserted into the roast will withdraw easily if the meat is cooked and tender.

VARIATIONS

1. GINGER POT ROAST: In Step 1, add 6 oz (9 tbsp) salt and 2 tbsp black pepper. In Step 2, use 2¼ tsp dehydrated garlic, 1½ lb (4½ cups) chopped dry onions, 6 lb 6 oz (1-No. 10 cn) canned tomatoes, 2 tbsp ground ginger, 1 tsp ground thyme, and 3 bay leaves.

2. YANKEE POT ROAST: In Step 2, add 2 lb (1¾ qt) diced fresh carrots, 2 oz chopped fresh parsley, 6 lb 6 oz (1-No. 10 cn) canned tomatoes, 1 tbsp ground allspice, 4 bay leaves, ½ tsp ground thyme, and 1 cup vinegar.

Figure 10. Recipe for beef pot roast (steam-jacketed-kettle method).

(7) When adding herbs to the liquid, rub them in the palms of the hands to release the flavor.

(8) When forming salisbury steaks, meatballs, or -other meat patties, rub the hands with a small amount of salad oil to prevent the meat from sticking to the hands.

b. JUDGING THE QUALITY. Meats cooked by moist heat are generally judged to be properly done when tenderness is satisfactory. Meat that is easily pierced with a fork, is tender enough for chewing. Both the meat and the gravy should bi a deep brown. The gravy should be well seasoned because it is an important part of braised meat dishes.

11. COOKING BEEF IN LIQUIDS. Cooking in water or other liquids is a moist-heat method of cooking. This method requires considerably more liquid than is required for braising. The stewing of meat is the cooking of browned or unbrowned small, uniform pieces in a small amount of water at a temperature slightly below boiling. Vegetables may be added. Beef stew (fig. 11) may be cooked covered, either in a steam-jacketed kettle or in an oven. Simmering is a term applied to the cooking of unbrowned large pieces of beef in a larger amount of water than is used in braising (fig. 12). In a simmering liquid (from 185° to 200° F.), few bubbles form, and they rise to surface only occasionally. Corned beef is most frequently cooked by simmering. Simmering is also the method used to make soup stock. Whether meat is simmered to cook it or to obtain the stock, the amount of water used should be just enough to cover the meat.

a. SUGGESTIONS FOR CONTROL OF QUALITY. Since some of the flavor of the beef is lost to the liquid, it is important that the liquid be used in making gravy that is served with the meat. Any vegetables added should enhance the flavor, color, and texture of the dish. Vegetables for beef stew are usually diced or sliced in pieces about the size of the meat pieces. The vegetables should be added to the beef stew after it is partially cooked so that they will not be overcooked when the meat is done. Beef should never be boiled if the tenderness, shape, flavor, and nutritive value of the beef are to be preserved. If excess liquid is used, the flavor of both the beef and the broth is diluted.

b. JUDGING THE QUALITY. The plasma proteins are coagulated more rapidly in moist heat than in dry heat, since water transfers heat more rapidly than does air. If meat is dry, it was probably cooked at a temperature that was too high. Meat that is not cooked long enough is tough, whereas meat cooked too long loses its shape or falls apart.

12. PREPARING VEAL. Veal is the flesh of young calves. The amount of connective tissue in veal is relatively high, but the connective tissue contains little elastin and becomes very tender under proper cooking conditions. Veal has only a very small layering of fat, a small amount of marbling, and a high moisture content. The cuts resemble beef cuts in shape but are only one-third to one-half the size. Veal is pale, rosy beige in color, whereas beef is red. Because veal has a very delicate flavor, it is often combined with other foods such as cheese or is served with savory sauces. Veal roasts, veal steaks, and ground veal are issued to the dining facilities (fig. 13). Veal roasts, vealburgers, grilled steaks, and ovenbaked steaks with various sauces are prepared in the same manner as beef.

YIELD: 100 Portions (2 Pans) EACH PORTION: 1¼ Cups

PAN SIZE: 18 by 24-inch Roasting Pan

INGREDIENTS	WEIGHTS	MEASURES		METHOD
Beef, diced, thawed,	30 lb			1. Dredge beef in a mixture of flour, salt, pepper, and garlic.
Flour, wheat, general purpose, sifted	8 oz	2 cups		
Salt	5 oz	½ cup		
Pepper, black		2 tbsp		
Garlic, dehydrated		5 tsp		
Shortening, melted	1 lb	2 cups		2. Brown beef in hot shortening.
Water, hot		2½ gal		3. Add water, tomatoes, and spices to meat. Cover. Simmer 2 hours.
Tomatoes, canned, crushed	6 lb 6 oz	3 qt (1-No. 10 cn)		
Thyme, ground		1 tbsp		
Bay leaves, whole		4 leaves		
Carrots, fresh, ½-inch rings	8 lb	7 qt		4. Add carrots and rutabagas to meat. Cover. Bring to a simmer. Cook 15 minutes.
Rutabagas, fresh diced (optional)	2 lb	2 qt		
Celery, fresh, cut in 1-inch pieces	4 lb	4 qt		5. Add celery and onions. Bring to a simmer. Cook 10 minutes.
Onions, dry, cut in quarters	3 lb	2½ qt		
Potatoes, white, fresh, cut in 1 to 1½-inch pieces	8 lb	6 qt		6. Add potatoes and salt. Stir to mix. Cover. Bring to a simmer. Cook 20 minutes or until vegetables are tender.
Salt	2 oz	3 tbsp		
Flour, wheat, general purpose, sifted	1 lb 2 oz	4½ cups		7. Thicken gravy, if necessary. Combine flour and water. Add to stew. Stir to mix. Cook 5 minutes or until thickened.
Water, cold		1½ qt		

NOTE: 1. 30 lb beef, boneless, pot roast, diced in 1 to 1½-inch pieces, may be used in Step 1; trim beef to remove excess fat and gristle.
2. 6 oz (2 cups) dehydrated onions may be used in Step 5. See Recipe Card A-11.
3. Steam-jacketed kettle, roasting pans on top of range or 350° F. oven may be used for browning and cooking meat and vegetable mixture.
4. Vegetables in Steps 4, 5, and 6 may be cooked separately then added to browned meat.

CH-4

Figure 11. Recipe for beef stew.

SIMMERED CORNED BEEF

YIELD: 100 Portions (2 Pans)			EACH PORTION: 3 Thin Slices (4 Ounces)	
PAN SIZE: 18 by 24-inch Roasting Pan			TEMPERATURE: 325° F. Oven	
INGREDIENTS	WEIGHTS	MEASURES		METHOD
Beef, corned, thawed	43 lb 8 oz	.....	.....	1. Place whole pieces of corned beef in steam-jacketed kettle or stock pot; cover with water.
Water	.....	To cover..	.....	2. Bring to a boil. Cover; reduce heat; simmer 2½ hours. Remove scum as it rises to surface.
				3. Remove corned beef from liquid.
				4. Place corned beef in roasting pans.
				5. Bake 1 hour or until tender.
				6. Let stand 12 to 20 minutes before slicing.

NOTE: 1. Meat may be simmered 5 hours or until tender in Step 2. Omit Steps 4 and 5. After 3 hours, test each piece of meat with fork to determine the tenderness.

2. Because the grain of brisket varies within a cut, turn the piece of meat while carving to ensure cutting across the grain to prevent shredding.

VARIATION

1. APPLE GLAZED CORNED BEEF: In Step 4, combine 4½ qt (3-No. 3 cyl cn) canned apple juice, ½ cup soy sauce, ¾ cup Worcestershire sauce, 2 cups vinegar, 1 oz (4 tbsp) mustard flour, and 1 lb (2¾ cups) brown sugar; pour over meat in roasting pans. Place in oven; bake 1 hour or until tender, basting every 15 minutes.

Figure 12. Recipe for simmered corned beef.

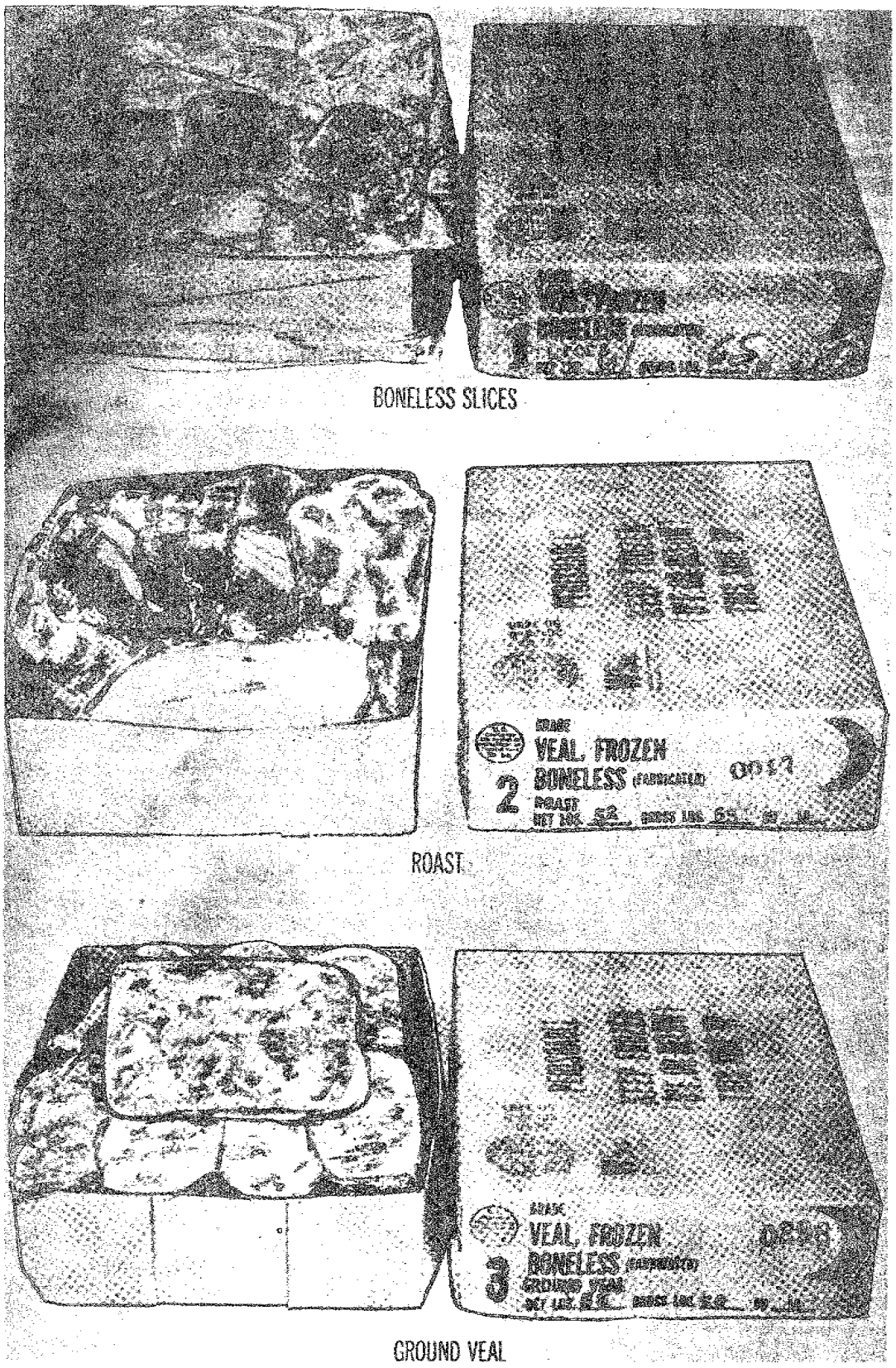


Figure 13. Packaged veal issued to dining facilities.

a. SUGGESTIONS FOR CONTROL OF QUALITY. The following suggestions Should help to insure a palatable finished product:

(1) Because the layer of fat is thin, moisture in veal evaporates rather rapidly. A roast may be covered with bacon strips, or the surface may be brushed with bacon drippings or vegetable oil to reduce the loss of moisture. Roasts are done when their internal temperature reaches 170° F.

(2) Veal steaks must be brushed with seasoned fat while they are grilling to prevent a dry finished product.

(3) When veal steaks are cooked in the oven, they are first breaded and browned to insure a juicy, flavorful dish.

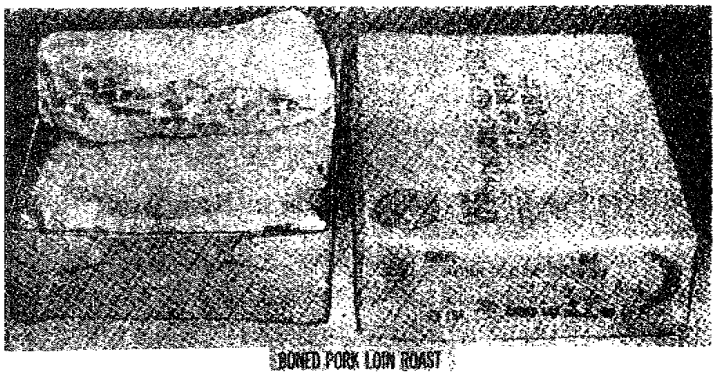
(4) Cheese added to a veal dish should not be overbrowned.

(5) Oven-baked steaks should not be allowed to become too brown, or they will lose their eye appeal.

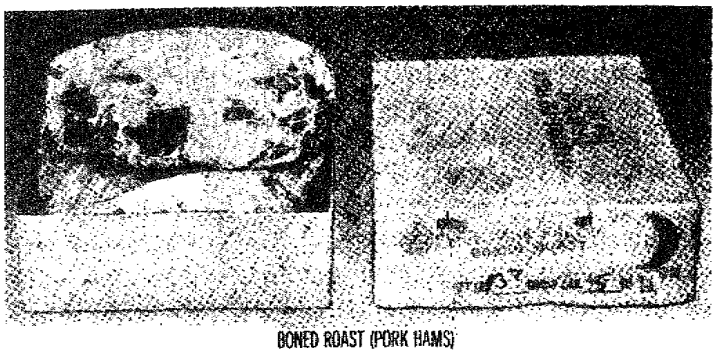
(6) Care should be taken not to overcook veal, or it will fall apart when served.

b. JUDGING THE QUALITY. Roast veal should be firm (not crumbly), tender, and juicy and should have a clear or faintly pink juice. Veal should always be cooked well done: there should be no pink color showing in the meat. Veal products that are breaded such as cutlets should be crisp and evenly brown on the outside and tender and moist on the inside. Breading should not be too thick.

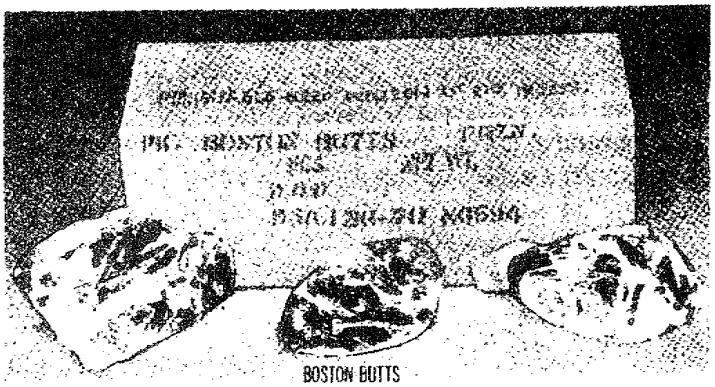
13. CUTS OF PORK. Pork, the flesh of hogs, is the lightest in color of all meats. Young pork is a grayish pink, and the flesh is firm and fine grained. Pork cuts are issued in fresh (frozen) and cured states. Pork butts, hams, loins, spareribs (fig. 14) and slices, bacon, and sausage are used to prepare the recipes given in Armed Forces Recipe Service. The loin is considered one of the choicest cuts of pork. It is used for roast pork and for pork chops prepared in a variety of ways by both moist- and dry-heat methods. Spareribs are made from the bony but flavorful rib section of a pork side. The pork butt (often called Boston Butt) is the skinned pork shoulder remaining after the "picnic ham" is removed. The pork butts, which are usually not cured or smoked, can be used for preparing many meat dishes. Hams come to the dining facility in a variety of forms: Cured, precooked boneless; cured, canned, whole or chunks; and boneless fresh ham., Because pork comes from young animals and is high in fat, it is usually tender. However, pork chops are better when cooked in moist heat than when grilled, even though the meat is tender. Pork must be cooked long enough to insure that the end-point temperature is high enough to destroy trichinella spiralis, an organism that may be present in pork. AR 40-5 specifies a minimum temperature of 150° F. However, an internal temperature of 17° F. is recommended for fresh pork to provide a uniformly cooked product and good acceptance by the troops. Bacon slices are issued as canned, prefried bacon. Also slab bacon is sliced 20 to 22 slices per pound for baking or grilling. Sausages come in a variety of types: frozen pork links and bulk sausage; canned pork links; precooked, frozen, pork-and-beef sausage; and chilled, frozen, and canned cooked frankfurters.



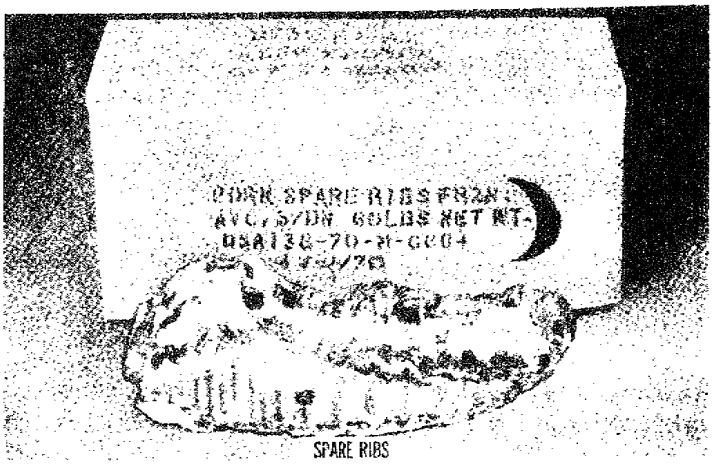
BONED PORK LOIN ROAST



BONED ROAST (PORK HAMS)



BOSTON BUTTS



SPARE RIBS

Figure 14. Packaged pork issued to dining facilities.

14. PREPARING PORK. Fresh and cured pork are prepared for serving in the dining facility in accordance with the standard recipes in Armed Forces Recipe Service. High-quality pork such as that procured by the Army is uniformly lean and is extensively marbled with a firm white fat. The exterior fat is firm, white, and dry. Even though pork is considered a tender meat, slow cooking temperatures reduce the cooking losses and produce a more tender, juicier meat.

15. ROASTING PORK. Meats cooked in the oven by dry heat are usually served as roasts. Pork loins and fresh pork hams are served as roasts, but bacon (fig. 15), cured ham, pork slices (chops), sausage links, and sausage patties cooked in the oven by dry heat are served as baked items.

a. SUGGESTIONS FOR CONTROL OF QUALITY. The only way to be sure that roasted pork is done is to use a meat thermometer and to cook the meat to the temperature specified in the recipe. The thermometer must be inserted into the center of the lean if it is to record the temperature of the lean. The temperature of the meat should begin to rise 20 to 30 minutes after the cooking begins. If the temperature does not rise, the thermometer may be imbedded in a fat pocket and should be moved slightly. When the thermometer registers the desired temperature, it should be pushed in slightly and the temperature observed; if the temperature drops, the meat should be cooked longer. Because the temperature of a roast tends to rise after the roast is removed from the oven, it is better to remove the roast when the temperature reaches 30 to 50 below the desired temperature (AR 40-5 specifies a minimum temperature; Armed Forces Recipe Service specifies 170° F. for roast pork and fresh roast ham) to avoid overcooking and to insure a juicier, more tender finished product. When bacon is cooked in the oven, the fat should be poured off as it accumulates. Baking sausages in the oven at high temperatures does not toughen them; however, it does cause excess loss in the size of the servings. Sausages should be turned occasionally while baking to insure even browning.

b. JUDGING THE QUALITY. Bacon should be crisp, without being brittle. Sausage should be cooked until the inside is gray with no tinge of pink showing. If roasted pork or baked ham is properly cooked—

(1) A fork can easily penetrate the meat.

(2) The meat can be sliced without crumbling.

(3) The fat is evenly browned without burned areas.

(4) The drippings are not burned.

(5) The meat of roost pork is gray with no tinge of pink showing.

16. GRILLING PORK. Ham slices, sausages, frankfurters, and bacon may be cooked on the grill. Sausage links and sausage patties must be thoroughly cooked. Precooked sausage needs less cooking; it may be grilled in about half the time required for thoroughly cooking other sausages.

YIELD: 100 Portions (5 Pans)				EACH PORTION: 2 Slices
PAN SIZE: 18 by 26-inch Sheet Pan				TEMPERATURE: 375° F. Oven
INGREDIENTS	WEIGHTS	MEASURES		METHOD
Bacon, sliced	12 lb.....	.....	.....	1. Arrange slices in rows (approximately 2 lb 8 oz per pan) across pan with fat edges slightly overlapping lean edges. 2. Bake 20 to 25 minutes, without turning, until bacon is crisp. Do not overcook. Drain off excess fat as needed. 3. Drain thoroughly on absorbent paper.

NOTE: 12 lb slab bacon may be used in Step 1. Slice bacon 18 to 20 slices per pound.

VARIATION

1. OVEN FRIED CANADIAN BACON: Use 12 lb 8 oz Canadian style bacon. Slice into 1 oz slices (200 slices). Place slices in a single layer on sheet pans; bake 8 to 10 minutes or until bacon sizzles.

CH-4

Figure 15. Recipe for baked bacon slices.

a. SUGGESTIONS FOR CONTROL OF QUALITY. Sausage links, sausage patties, and bacon cooked on the grill should be turned frequently to insure even browning. Excess fat should be drained from the griddle as it accumulates to prevent it from burning and producing offensive odors. The rim of fat on ham slices should be slashed (fig. 16) so the slices brown evenly and do not curl.

b. JUDGING THE QUALITY. Pork properly cooked by grilling should have the characteristics listed below:

(1) Ham slices should be evenly browned without any burned areas.

(2) Sausage links and patties should be cooked until the inside is gray with no tinge of pink remaining.

(3) The outside of sausage links and patties should be a deep brown but should not be burned.

(4) Bacon should be crisp and brown without being burned.

(5) Frankfurters should be juicy and plump with no burned areas.

17. BRAISING PORK. Pork is usually tender enough to be cooked by a dry-heat method, but since it must be thoroughly cooked, many recipes in Armed Forces Recipe Service indicate cooking by a moist-heat method. For braising pork slices (chops) and spareribs, the meat is first browned, liquid is added, the cooking pan is covered to keep in the steam, and the meat is cooked in the oven. Excess fat is drained from the pan as it accumulates or before the liquid is added.

18. COOKING PORK IN WATER. For use in chop suey, pork butts are diced, browned, and simmered in water. Frankfurters may be simmered and served as indicated in many recipes. The following suggestions should help to insure a quality finished product:

a. When diced pork is to be simmered, brown it in its own fat.

b. Simmer diced pork in just enough water to cover the meat.

c. Prepare simmered frankfurters in batches so that only plump juicy ones are served. Simmered frankfurters left on the serving line for long periods of time shrivel and become tough and discolored.

19. PREPARING LAMB. Lamb is the meat of young sheep, less than a year old. Lamb flesh is darker red than veal, and the cuts are smaller. Most cuts of lamb are tender, and unlike veal, lamb steaks and chops may be broiled without becoming dry. Lamb roasts and chops are issued to dining facilities. These cuts are roasted, braised, or grilled in the same manner as other meats. The following suggestions should help to insure a quality finished product:

a. Do not overcook a roast, or it will be difficult to slice.

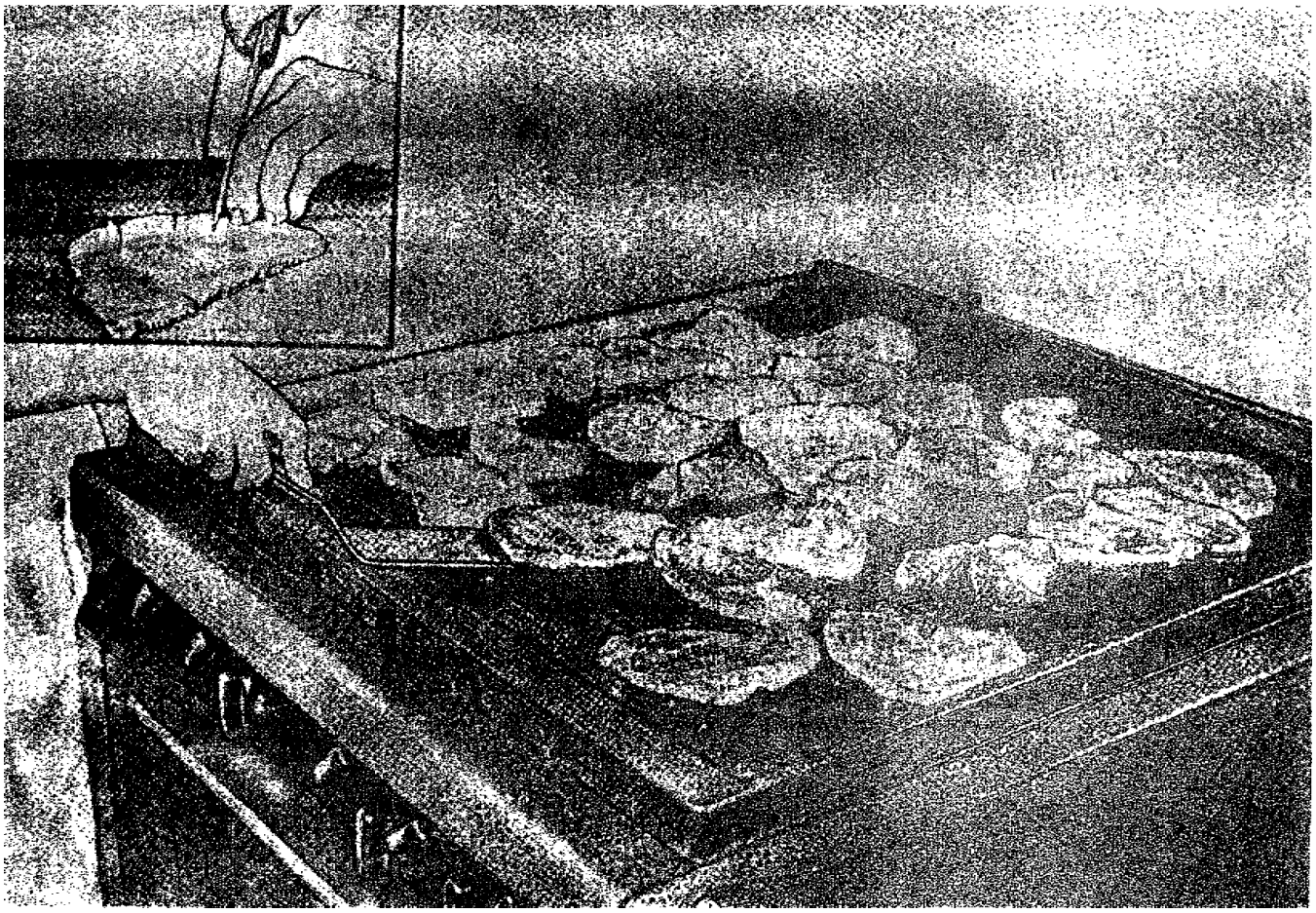


Figure 16. Grilled ham slices.

b. Insert the meat thermometer in the roast after the meat has been cooking 2 hours, and roast the meat until the thermometer registers the desired temperature (165° F. for rare, 175° F. for medium, and 180° F. for well done).

c. Let roasts stand 20 minutes before slicing them.

d. Serve meat very hot, or the fat will congeal.

SECTION III

FISH

20. GENERAL. Fish, which contain high-quality protein, are a valuable source of minerals and essential vitamins A, B, and D. In general, the mineral content of fish (magnesium, calcium, phosphorous, iron, copper, and iodine) is similar to that of beef, except that the iodine content of fish is higher. The fat content of fish varies, but pound for pound, fish have about half the calories of beef and pork. Fish are generally classified as finfish or shellfish. Finfish are further divided into two types, lean and fat. The lean fish, which include haddock, halibut, cod, flounder, and perch, contain less than 5 percent fat. The fat fish, which include bluefish, mackerel, salmon, and shad, contain more than 5 percent fat. The type of fish determines the method of cooking. Fat fish are best for baking and broiling, because the fat content prevents them from drying out during cooking. Lean fish may be cooked by these methods if brushed or basted with melted fat. Because of their low fat content, both types of finfish can be fried successfully. Shellfish issued to the dining facility include clams, scallops, oysters, and shrimp. In general, shellfish can be prepared by the same cooking methods used for finfish. Fish have less fat, extractives, connective tissues, and color than meats. Because of these differences, the objectives of fish cookery are to change the texture, to develop the flavor and color, and to retain the form. Although fresh fish have little odor, they deteriorate rapidly. To prevent deterioration, frozen fish should be stored in the freezer in the original wrapper and should not be thawed until time for preparation. For the best flavor, the fish should be thawed by placing them in the refrigerator for several hours. This procedure prevents the drip that takes place when fish are thawed at room temperature, and reduces the loss of moisture and nutrients. Fish once thawed should be cooked immediately and should never be refrozen.

21. PREPARING FINFISH. Fresh finfish, which are issued in the frozen state to the dining facility, include fillets, steaks, and portions (sticks). Fillets, the sides of the fish cut lengthwise away from the backbone, are practically boneless and are ready to cook. A fillet cut from the side of a fish is called a single fillet; a fillet may have the skin left on or may be skinless. Fish steaks are cross-section slices of the larger size dressed fish. A cross section of the backbone is usually the only bone in the steaks, which are ready to cook as purchased. Frozen portions are uniformly shaped fish flesh, breaded and ready to cook. Armed Forces Recipe Service contains recipes for cooking finfish by baking, oven frying, and deep-fat frying. Finfish are tender because they have little connective tissue. They require a short cooking time at a low temperature.

22. BAKING FINFISH. Thawed fish fillets or steaks are placed in a single layer on a greased pan and baked as prescribed in the recipe. Thawed fish fillets are dredged in crumbs and then baked; frozen fish portions may be baked also. To provide variety and to prevent drying, sauces may be used with the baked fish.

a. SUGGESTIONS FOR CONTROL OF QUALITY. To control the quality and insure the palatability of the finished product, the suggestions given below should be followed:

(1) When baking lean fish, baste them often with butter or margarine.

(2) Avoid overcooking. Fish is done when its protein is coagulated, that is, it flakes easily.

(3) Garnish fish with paprika, parsley, and other colorful, edible food items to improve the appearance of the dish.

(4) Exercise caution when serving baked fish, because it breaks and crumbles easily.

b. JUDGING THE QUALITY. When the flesh of the fish is cooked just enough to flake easily when tested with a fork, the end product is moist, tender, and flavorful. Properly baked fish is not dry and does not show evidence of burning. On the other hand, if the flesh is gluey, it is undercooked.

23. DEEP-FAT FRYING FINFISH. Lean fish such as haddock and flounder are best for frying. The frozen fish fillets are breaded to insure a crisp, golden-brown coating. Too many servings of fish should not be fried at one time, because the temperature of the fat will be reduced so low that the pieces will not cook evenly and will absorb excess fat. The flake test method is used to determine the doneness of fish.

a. SUGGESTIONS FOR CONTROL OF QUALITY. The following suggestions should help to control the quality of deep-fat-fried fish:

(1) Prepare the fish, and have them ready so as to avoid premature heating of the fat.

(2) Shake off excess flour, cornmeal, crumbs, or other coating material to prevent it from dropping off into the fat and burning, thereby hastening the decomposition of the fat.

(3) Insure that the surface of the fish is dry to avoid undue amounts of moisture in the fat.

(4) Heat the fat in which the fish is to be cooked to the temperature specified in the recipe. Low temperatures permit the fish to absorb more fat.

(5) Add small amounts of fish at a time so the temperature of the fat does not drop too rapidly.

(6) Do not overbrown the fish, or the servings will lack eye appeal.

(7) Drain the fish to remove excess fat.

b. JUDGING THE QUALITY. Deep-fat-fried fish should be golden brown and moist, and should be cooked until the flesh flakes easily when tested with a fork. Overcooked fish are hard and dry.

24. PAN FRYING FISH. Thawed fish fillets or steaks may be pan fried or cooked on a well-greased 350° F. griddle. The fat should be hot before the fish are placed in the pan, to prevent the flesh from sticking to the pan. If the skin is left on the fish, the fish should be placed skin side up in the pan. The fat should remain at a moderate temperature during the cooking process.

25. PREPARING CANNED FINFISH. Canned salmon is included on the menu for Army dining facilities in the form of salmon cakes, loaf, and salad and as scalloped salmon. Canned tuna is used to prepare baked tuna and noodles, tuna salad, and scalloped tuna and peas. Canned finfish are prepared by the same cooking methods as fresh fish; for example, salmon cakes are deep-fat fried, and tuna and noodles are baked. The same precautions are taken to control the quality of cooked, canned finfish as are used for fresh finfish. The canned fish should produce a palatable, appetizing dish.

26. PREPARING SHELLFISH. Because shellfish, like finfish, deteriorate very rapidly, they must be cooked as soon as they are thawed. Once thawed, they should not be refrozen. Usually, frozen oysters, shrimp, scallops, and clams are issued to dining facilities. However, canned shrimp and clams and dehydrated shrimp may be substituted in the same recipes. Shellfish, a tender meat, are often cooked by moist heat, but become tough quickly at temperatures above simmering. For example, only 5 minutes is required to cook shrimp for use in salads and curries.

a. SHRIMP. All varieties of shrimp have tender, white meat and have a distinctive flavor that is very popular. When they are cooked, they turn an attractive pink color. Simmering (actually the finished product is called "boiled" shrimp) is the basic method of cooking shrimp, although they may be peeled and then cooked by the same methods used for fresh finfish. Also Armed Forces Recipe Service gives a recipe for shrimp gumbo, a soup. If shrimp are not issued deveined, the dark sand vein down the back must be removed. Guidelines for using shrimp, from Armed Forces Recipe Service, are shown in figure 17. The following are some additional guidelines:

(1) Cooked shrimp should be immediately removed from the water, or they will shrink and toughen.

(2) Deep-fat frying of shrimp requires the same control of quality as deep-fat frying finfish (para 23a).

(3) Overcooking reduces the flavor and causes toughness.

b. OYSTERS. Oyster information from Armed Forces Recipe Service is shown in figure 18. Frozen, shucked oysters are issued to dining facilities for the preparation of fried and scalloped oysters, and of oyster stew. Regardless of the cooking method, just enough heat should be applied to heat the oyster through and to leave them plump and tender. All oyster dishes should be served piping hot. For deep-fat frying oysters, the coating should be pressed firmly on each oyster so it will not fall off while frying. The same precautions should be taken for frying oysters (fig. 19) as for frying of other foods. The following information should help in controlling the quality of the finished product:

(1) Overhandling of oysters bruises or breaks the membranes.

GUIDELINES FOR USING SHRIMP

Type Shrimp	Number of Shrimp A.P. per pound	Number of Shrimp per portion	Boiled		French Fried	
			Approx. lb per 100 portions	Approx. lb cooked	Approx. lb per 100 portions	Frying Time 350° F.
Shrimp, frozen, raw, unpeeled, regular	21 to 35	5 to 8	25 lb	11 lb	25 lb	2 to 3 minutes.
Shrimp, frozen, raw, peeled, deveined	26 to 44	5 to 8	20 lb	11 lb	20 lb	2 to 3 minutes.
Shrimp, cooked, dehydrated		6 to 9	2.44	11 lb	2.44	1½ minutes.
Shrimp, frozen, raw, breaded, deveined	17 to 28	7 to 10			38 lb	3 to 4 minutes.
Shrimp, frozen, raw, molded, breaded, deveined	9	4			38 lb	3 minutes.

NOTE: 1. If shrimp are to be breaded then fried, thaw in the refrigerator (40° F. to 45° F.). Once shrimp have thawed, do not refreeze.

2. To rehydrate dehydrated cooked shrimp — for 100 Portions: Cover contents of 3-No. 10 cn shrimp with 2¼ gal lukewarm (90° F. to 100° F.) water to which 2 oz (3 tbsp) salt has been added. Let stand 20 minutes. Drain and add to cooked sauce or cover and chill thoroughly for appetizer or salad use.

3. Do not allow frozen breaded shrimp or frozen molded breaded shrimp to thaw before cooking.

CH-4

Figure 17. Guidelines for using shrimp.

OYSTER INFORMATION L-G. FISH No. 1

Frozen shucked oysters packed in one gallon (6 lb) cans are procured for military use. When defrosted and drained 1 can of oysters will yield 4 lb drained oysters and 2 lb (1¾ qt) oyster liquid. Frozen shucked oysters should not be defrosted until ready to use; once defrosted, they should never be refrozen.

Unless otherwise specified, all recipes will list oysters, E.P. denoting the drained weight of defrosted oysters.

EASTERN OR GULF

Size	Amount per 6 lb gallon	Recommended Use
Extra large	Not more than 113 (counts)	Fried.
Large	113 to 148 (extra selects)	Fried.
Medium	149 to 212 (selects)	All recipes.

PACIFIC OYSTERS

Size	Amount per 6 lb gallon	Recommended Use
Small	69 to 101	Fried.
Extra small	102 and over	All recipes.

NOTE: Frozen shucked oysters should never be served raw.

CH–1

Figure 18. Oyster information.

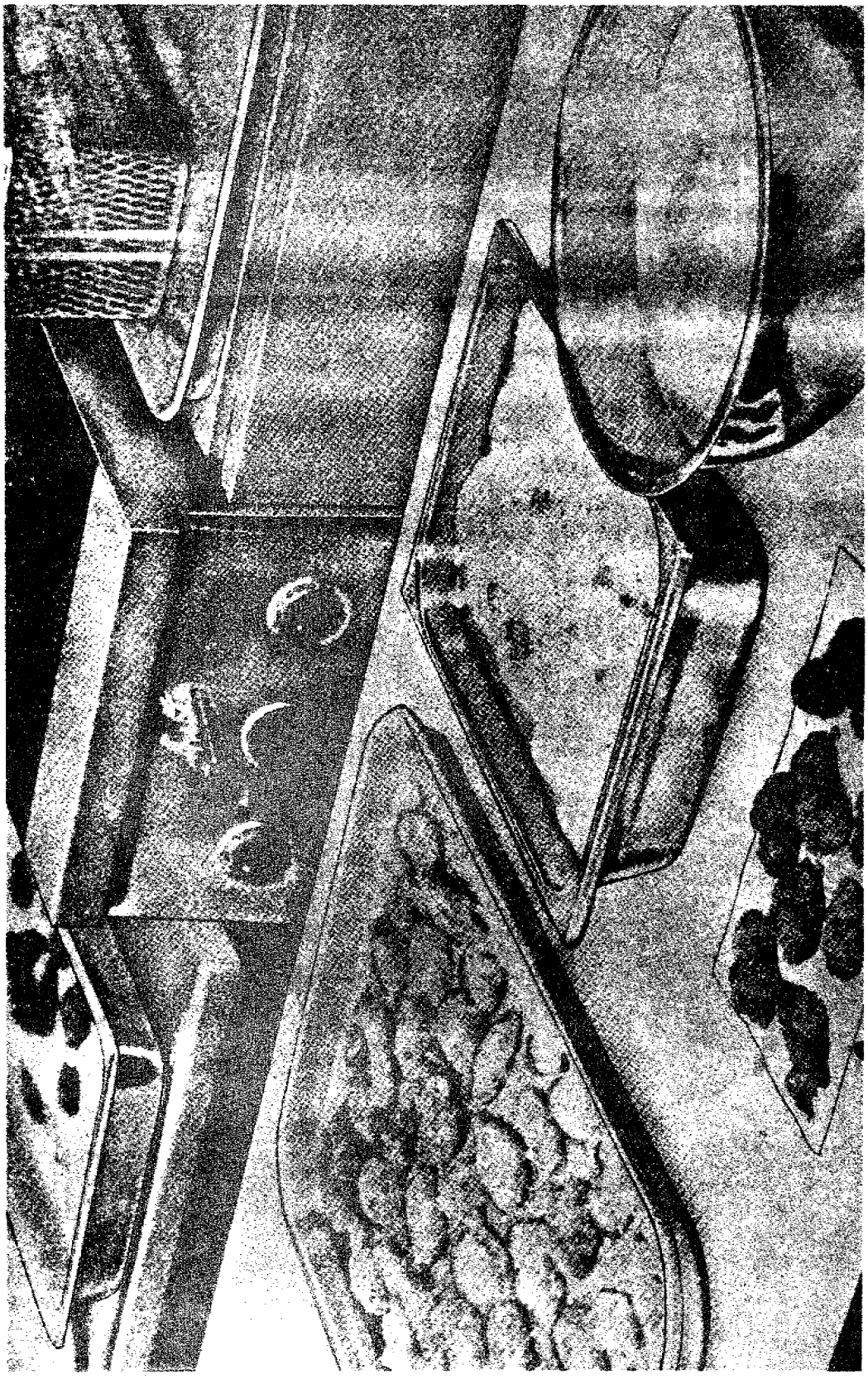


Figure 19. Deep fat-fried oysters.

(2) Using a fork for handling oysters is not recommended.

(3) Stewing of oysters should continue only until the edges of the oysters begin to curl.

(4) Overcooking produces tough oysters.

c. SCALLOPS. A scallop is actually the round, meaty muscle which opens and closes the scallop shell. It is a solid piece of cream-colored, very lean, juicy flesh which has a sweet, delicate flavor. Scallops are issued in the frozen state. They may be deep-fat fried (fig. 20), baked with a sauce or made into stew. Scallops are deep-fat fried in the same manner as finfish (pars 22).

d. CLAMS. Clams are bivalves which have darker flesh than that of oysters. The most popular clam dish is chowder or soup. Some clams can also be deep-fat fried or steamed, and others can be served raw as cocktails. If clams are overheated, they become tough. When canned clams are Issued for the preparation of a clam dish, they are substituted as indicated in the standard recipe.

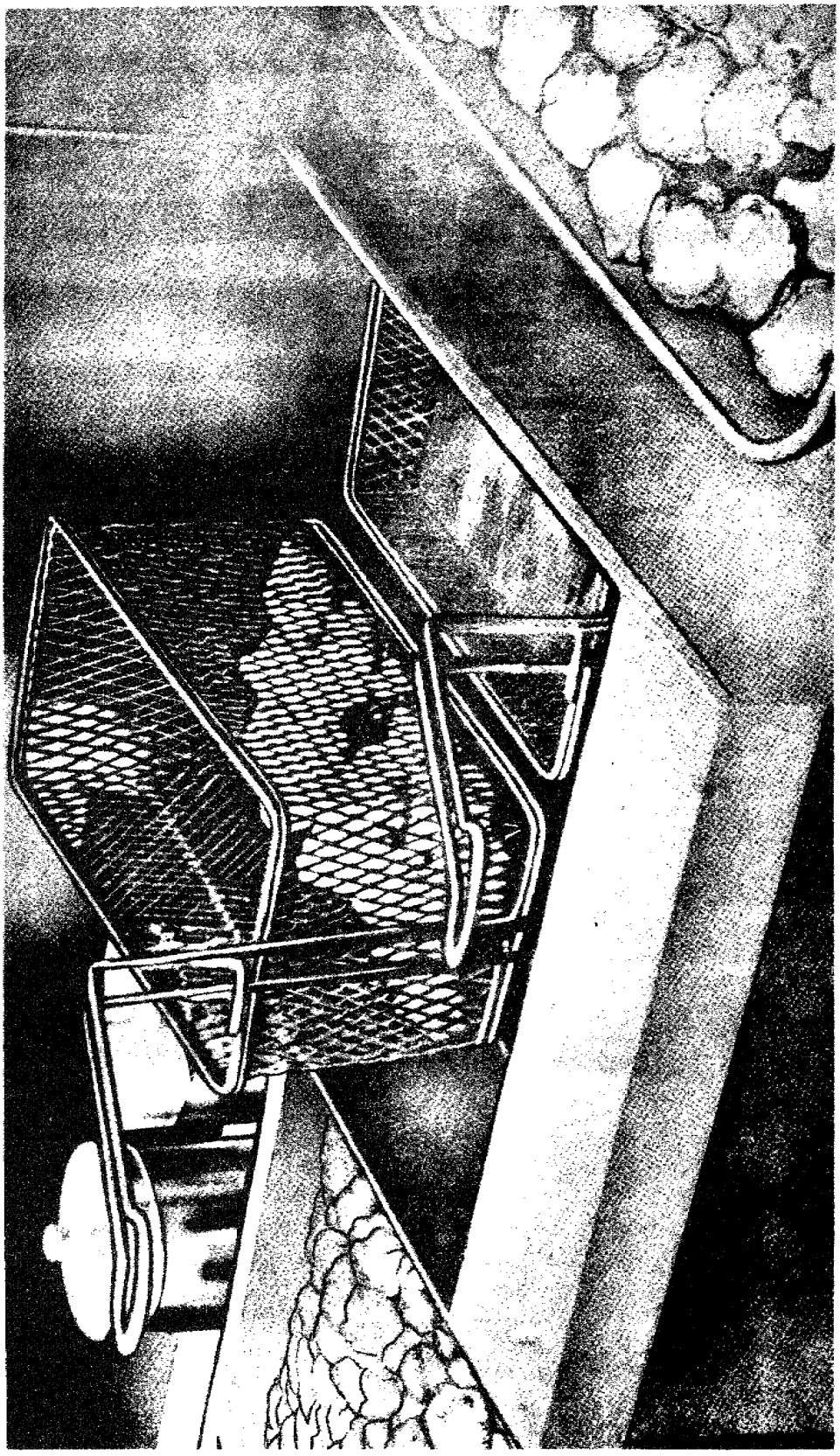


Figure 20. Fried scallops.

SECTION IV

POULTRY

27. GENERAL. Poultry flesh contains high quality protein as well as fat, minerals, and vitamins. The amount of fat, minerals, and vitamins varies with the age of the bird. Young poultry have less fat and therefore fewer calories than most meats. The fat content of light meat is lower than that of dark meat. Chickens, turkeys, and ducks are the types of poultry served in Army dining facilities (fig. 21). In general, the cooking procedures for poultry are the same as those for meats. The old or tough birds are cooked by moist heat methods, and the younger ones by quicker methods. Regardless of the cooking method, poultry should always be cooked well done. For baking, large birds should be cooked slowly to reduce shrinkage and to retain moisture, and smaller birds should be cooked at somewhat higher temperatures to prevent them from drying out while cooking. Although raw poultry has little flavor, it develops flavor during cooking. The dark meat is usually more juicy but less tender than the light meat. Like most other high-protein foods, poultry is very perishable and should be refrigerated at a low temperature (32° to 35° F.). Usually, poultry is issued to dining facilities in the frozen state. Once thawed, poultry should not be refrozen. Hard-frozen birds may be kept in the original packaging for about 3 days at a temperature of 32° to 35° F.

28. PREPARING CHICKEN. Chickens are classified according to age and tenderness. Tender birds called broilers, fryers, or roasters are usually less than 1 year old and can be cooked by dry-heat methods. The recipes for chicken in Armed Forces Recipe Service indicate that the broiler-fryers are issued for baking, for deep-fat frying, and for cooking moist-heat dishes such as chicken pot pie, barbecued chicken, and chicken a la king (fig. 22). These chickens are under 16 weeks old and have very tender flesh and flexible skin. Roasters are young chickens of either sex and are 5 to 9 months old; they have tender flesh and flexible skin. Moderate heat should be used in cooking chicken to develop maximum flavor, tenderness, color, and juiciness. Intense heat hardens and toughens the protein, shrinks the meat, and causes the juices to be released, thus resulting in a less palatable meat.

29. BAKING CHICKEN. When the recipe calls for baked chicken, broiler-fryer chickens are prepared and cooked whole in the oven. Baked chicken, however, is usually cut into serving pieces and prepared for serving as savory baked chicken, as barbecued chicken, or as oven-fried chicken.

a. SUGGESTIONS FOR THE CONTROL OF QUALITY. Each recipe gives the method of preparation and gives any notes needed to insure a palatable food item. The following are additional suggestions that should help to control the quality of baked chicken:

(1) When a meat thermometer is used to control temperature, it should be inserted between the thigh and the body of the chicken and should not be allowed to touch any bone. The meat is done when the temperature reaches 180° F. Another method of determining doneness is to twist the leg bone; if the joint between the drumstick and the thigh yields easily or separates, the meat is done.

GUIDELINES FOR USING POULTRY

Types	Weight Range			Lb per 100 Portions	
	Minimum	Maximum		Pieces (Slices)	Diced
READY-TO-COOK					
Chicken:					
Broiler-Fryer, Cut-Up	2 lb	2 lb 12 oz		50	45
Broiler-Fryer, Quartered	2 lb	2 lb 12 oz		65	45
Broiler-Fryer, Whole	2 lb	2 lb 12 oz		65	45
Duck	3 lb 8 oz	5 lb		100	
Rock Cornish Hens	1 lb 4 oz	1 lb 8 oz		68 lb 12 oz	
Turkey:					
Young hens or yearling hens	12 lb			65	45
Young toms	16 lb	24 lb		65	45
BONELESS					
Turkey, raw	9 lb	12 lb		40	26
Turkey, cooked	6 lb	7 lb		28	18
DEHYDRATED					
Chicken, cooked, diced, 20 oz (1-No. 10 can)					4 lb 8 oz (4 cans)
CANNED					
Chicken or Turkey, boned, 29 oz can					18 lb 2 oz (10 cans)

NOTE: 1. Inspect all poultry and clean as needed. Remove any spongy lung tissue from inside of back; pull out pinfeathers and fat not removed in the original cleaning. Wash all poultry thoroughly inside and out under cold running water; drain thoroughly. Refrigerate all poultry until ready to use.

2. When cleaning whole, ready-to-eat chickens, ducks, turkeys, and Rock Cornish Hens, remove and refrigerate the neck and giblets until ready to use.

3. If desired, necks and giblets may be reserved for use in gravies, soups, and dressings. Keep refrigerated until ready to use.

Figure 21. Types of poultry issued to dining facilities.

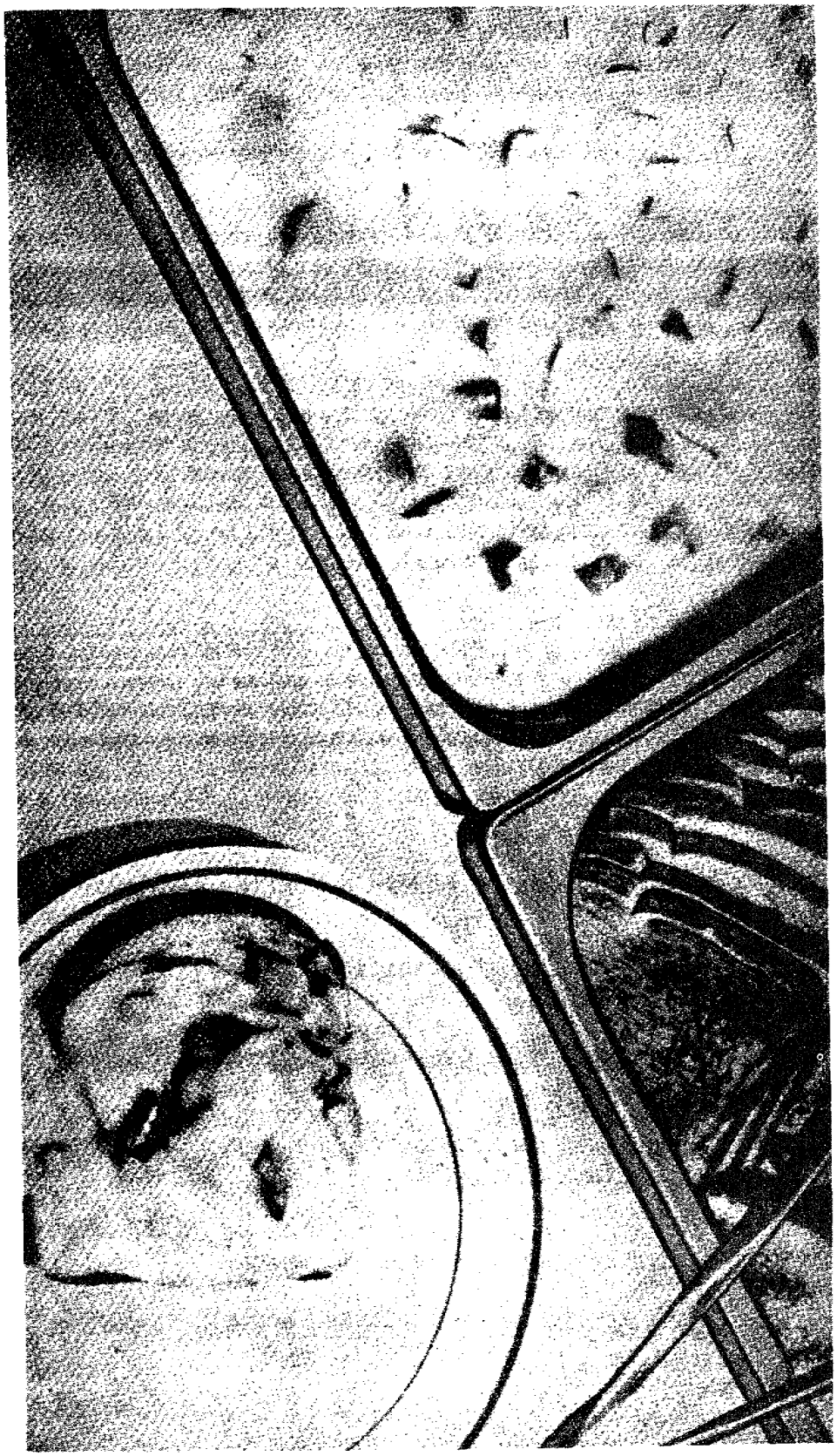


Figure 22. Chicken a la king.

(2) The legs and wings of the chicken must be secured so the chicken cooks more evenly and retains its shape. The modern and convenient method for preparing chicken for roasting is to tuck the ends of the drumsticks back under the skin flap at the end of the breastbone and to tuck the wings behind the back.

(3) Baked chicken should be allowed to cool 15 to 30 minutes for easier carving.

b. JUDGING THE QUALITY. Roasted chicken should have brown, tender skin and moist, flavorful meat firm enough for clean-cut slices. When the meat is cut, there should be no evidence of blood, indicating raw or rare areas. The skin of the chicken should be crisp and brown with no splitting of the meat on the thighs or breast.

30. DEEP-FAT FRYING CHICKEN. The standard recipe for fried chicken (fig. 23) gives the procedures for the preparation and lists some notes which should help in controlling and in judging the quality of the finished product. The same precautions should be taken for deep-fat frying of chicken as are taken for deep-fat frying of finfish (para 23). Fried chicken should be crisp and flavorful, should be well cooked to the bone. It should have a brown surface, tender skin, and juicy, tender flesh with low fat absorption (not greasy).

31. COOKING CHICKEN BY MOIST-HEAT METHODS. Chicken is simmered until done, and the meat is removed from the bone and used in making chicken pot pie, baked chicken with noodles, baked chicken with rice, and chicken salad. For chicken creole, country style chicken, chicken cacciatore, chicken fricassee, and other chicken dishes, the meat is dredged and browned, then covered with the appropriate sauce or other liquid, and cooked. The following suggestions should help to obtain a palatable finished product:

a. Brown chicken to a golden brown; do not overbrown or burn it.

b. When sautéing vegetables to be used in the chicken product, do not let them brown.

c. Do not overbake oven-cooked dishes, or the chicken will fall away from the bone.

d. If chicken is browned in the deep-fat fryer, exercise the same precautions as for other meats.

e. If potatoes and carrots are to be added to chicken dish, cook them in stock or water only until tender.

f. Cook the roux for fricassee and other dishes at least 5 minutes to avoid a raw flour taste in the sauce.

g. Be careful not to overbrown the cheese when preparing chicken tetrazzini.

FRIED CHICKEN L. POULTRY No. 137

YIELD: 100 Portions				EACH PORTION: 2 Pieces
PAN SIZE:				TEMPERATURE: 325° F. Deep Fat
INGREDIENTS	WEIGHTS	MEASURES		METHOD
Chicken, broiler-fryer, cut-up	50 lb			1. Wash chicken thoroughly under running water. Drain well.
Flour, wheat, hard	4 lb	3¾ qt		2. Dredge chicken in seasoned flour; shake off excess.
Salt	8 oz	¾ cup		
Pepper, black		3 tbsp		3. Fry until golden brown or until done.
Paprika, ground		1 tbsp		4. Drain in basket or on absorbent paper.

NOTE: 1. 65 lb chicken, broiler-fryer, whole, may be used in Step 1. Cut into quarters or eights.
2. Frying should be scheduled to allow fried chicken to be served immediately. If necessary, fried chicken may be held in an open pan in oven at 200° F. until serving time.
3. Meatier pieces may require longer cooking. Test for doneness. Fried chicken should be fork-tender—the fork will pierce the thickest piece easily.
4. Approximate frying time for cut-up chicken is:

Wings—5 to 7 minutes	Thighs—10 to 15 minutes
Legs—8 to 10 minutes	Breasts—10 to 15 minutes

VARIATIONS

1. SOUTHERN FRIED CHICKEN: In Step 3, brown chicken in batches in 350° F. deep fat approximately 5 to 10 minutes. Place chicken in three 18 by 24-inch roasting pans. Bake uncovered in 350° F. oven about 45 minutes or until chicken is tender.
2. SOUTHERN FRIED CHICKEN WITH EGG DIP: In Step 2, prepare egg dip by mixing 5 oz (1 ⅛ cups) nonfat dry milk, 5 ½ cups water and 2 lb (1 qt) beaten whole eggs (20 eggs). Dip chicken in mixture, drain, and then dredge chicken pieces in seasoned flour; shake off excess. Continue as in Step 3, Variation 1.

Figure 23. Recipe for fried chicken.

32. PREPARING CANNED CHICKEN. Standard recipes stipulate that canned chicken may be used for baked chicken with noodles or rice, chicken a la king, chicken pot pie, chicken tetrazzini, chicken salad, and other chicken dishes. When canned chicken is substituted for fresh chicken, as indicated in the recipe, the dish is prepared and cooked in the same manner.

33. PREPARING TURKEY. The ready-to-cook turkeys issued to the dining facility are usually less than a year old and have tender meat and flexible skin and breastbone. These turkeys are roasted (fig. 24) at a low temperature, since cooking at a high temperature causes the meat to be stringy, tough, and unappetizing. A meat thermometer should be used to insure that all parts of the turkey are cooked to a satisfactory degree of doneness. Ready-to-cook turkeys are roasted until the thermometer registers an internal temperature of 180° to 185°° F. Boneless, frozen turkeys are roasted in the same manner as whole turkeys. However, they are done when the meat thermometer registers an internal temperature of 170° to 175° F. Cooked or canned turkey may be used to make many turkey dishes such as baked turkey with noodles or rice, creamed turkey, turkey pot pie, turkey salad and turkey a la king. These dishes are prepared in the same manner as comparable chicken dishes. Listed below are some suggestions for controlling the quality of roast turkey:

a. Tuck eggs and tall into cavity. Place in roasting pans, breast side up. Turkeys should not touch each other.

b. If the turkey becomes too brown, cover it loosely with a tent of foil during the last hour of cooking. Do not cover it completely, or steam will be created.

c. When the turkey is removed from the oven, let it stand at least 30 minutes to absorb juices and to become more suitable for slicing.

d. remove string and skin from boneless turkey roasts before slicing the roasts.

e. If the drippings evaporate, baste the turkey with a mixture of half water and half butter. As long as the pan is not covered, the turkey will still toast without steaming, and the drippings will not burn.

f. Baste frequently with drippings.

34. PREPARING DUCK. Ducks, which have only dark meat, provide less meat in proportion to bone than do other types of poultry. The frozen ducks issued to dining facilities are young ducks of either sex and are usually less than 16 weeks old. They weigh about 4 pounds, and when roasted about 2 hours, they make a very palatable menu item. Because ducks are very fat, they are efficient self-basters during roasting. However, the extra fat must be poured off frequently during the roasting period to keep the duck from frying and to insure a clear, light-colored fat for gravy or sauce. The following suggestions should aid in controlling the quality of baked duck:

ROAST TURKEY L. MEAT, FISH, AND POULTRY No. 14(2)

YIELD: 100 Portions (2 Pans)				EACH PORTION: 3 Slices (4 Ounces)
PAN SIZE: 18 by 24-inch Roasting Pan				TEMPERATURE: 325° F. Oven
INGREDIENTS	WEIGHTS	MEASURES		METHOD
Turkey, ready-to-cook	65 lb			1. Remove bands from legs; open turkey cavity. Remove giblets and neck; cut off wing tips.
Salt (optional)	8 oz	¼ cup		2. Wash turkey thoroughly inside and out under running water. Drain thoroughly.
				3. Rub cavity with salt.
Salad oil	8 oz	1 cup		4. Tuck legs and tail into cavity. Place in roasting pans, breast side up. Turkeys should not touch each other.
				5. Rub skin with salad oil. DO NOT ADD WATER.
				6. Insert meat thermometer in center of inside thigh muscle of smallest bird.
				7. Roast uncovered until meat thermometer registers 180° F. to 185° F. (See timetable.)
				8. Baste frequently with drippings.

ROAST TURKEY L. MEAT, FISH, AND POULTRY No. 14(2)

NOTE: 1. If desired, wing tips may be used in making stock for gravy, dressing or soup.
2. Frozen, ready-to-cook turkey must be thawed sufficiently to remove giblets. Place frozen turkey in refrigerator to permit gradual thawing; heavy turkeys, 16 lb and over—2 to 3 days; lighter turkeys, under 16 lb—1 to 2 days.
3. If V-shaped racks are available, place in roasting pans to support birds.
4. If no thermometer is available, move the leg by grasping the end bone; if the joint moves easily, the ligaments are tender and the meat is done.
5. Alternate roasting method: In Step 4, turkeys may be placed breast side down in pans.
6. If turkey begins to brown too soon, cover with loose tent of aluminum foil.
7. Omit Steps 5 and 8 if self-basting turkeys are used.

TIMETABLE FOR ROASTING TURKEYS (UNSTUFFED)

Weight of Turkey	Oven Temperature	Cooking Time (hours)
12 to 14 lb	325° F	4 to 5
14 to 20 lb	325° F	5 to 6
20 to 24 lb	325° F	6 to 7½

For best results in slicing allow to stand 30 minutes.

SERVINGS PER TURKEY

Ready-to-Cook Weight	Number of Servings
12 to 15 lbs	20-32
16 to 24 lbs	33-50
	(about 2 servings per pound)

CH-4

Figure 24. Recipe for roast turkey.

a. Do not prick the skin of the duck while it is roasting, or the meat will dry, and the skin will have a gray cast.

b. If the duck is to be batted, as is Hawaiian baked duck, prick the skin of the duck before roasting it. Baste the duck with a mixture of orange juice and pineapple juice to prevent dryness.

c. If a glaze is used during the last 30 minutes of the baking process, pour off the fat, and brush the skin of the duck evenly with the glaze. Repeat the glazing every 10 minutes, or more often if necessary, to keep the glaze from burning in the pan.

PROGRAMMED REVIEW

The questions in this programmed review give you a chance to see how well you have learned the material in Lesson 3. The questions are based on the key points covered in the lesson.

Read each item and indicate your choice by circling the appropriate letter. If you do not know, or are not sure, what the answer is, check the paragraph reference that is shown in parentheses right after the item; then go back and study or read once again all of the referenced material and write your answers.

After you have answered all of the items, check your answers with the Solution Sheet at the end of this lesson. If you did not give the right answer to an item, erase it and write the correct solution in the space instead. Then, as a final check, go back and restudy the lesson reference once more to make sure that your answer is the right one.

REQUIREMENT. Exercises 1 through 19 are multiple choice. Each exercise has only one single-best answer. Indicate your choice by circling the appropriate letter.

A1. What is the preferred method of cooking meat which has very little connective tissues? (para 1)

a. Cooking in liquid.

b. Braising.

c. Moist heat.

d. Dry heat.

A2. A flat roast cooks in less time than a chunky one of the same weight, because (para 4a (3))

a. heat penetrates to the center more quickly.

b. a flat roast browns more evenly.

c. a higher temperature may be used.

d. a flat roast has more connective tissue.

A3. A general rule for slicing meat is to cut all slices parallel to the cut surface of the meat. When is the general rule inappropriate? (para 4b & fig. 12)

a. When there is a need to change the size of the slice.

b. When several different cuts are sliced on the slicing machine at the same time.

c. When a uniform slice of meat is not required--as for a combination dish.

d. When slicing brisket, which has grain running in many directions.

A4. Which one of the following is not a recommended procedure to be used when slicing roast meat? (para 4b(5))

a. Remove the strings and skewers.

b. Cut the meat across the grain.

c. Slice the meat as soon as it is removed from the oven.

d. Set the slicing machine at the proper cycle for a fast carving job.

A5. If a meat loaf cracks before it is taken from the oven, a food service super-visor would recognize that (para 8b(3))

a. the onions and celery were not chopped finely.

b. the loaf was overmixed.

c. the temperature of the oven was too low.

d. the loaf fried rather than roasted.

A6. For braising, beef should first be well browned because (para 10a)

a. browning reduces the cooking time.

b. slow, moist heat dissolves the color.

c. connective tissue is tenderized by the application of high temperatures used in browning.

d. browning reduces the coagulation of the collagen and thereby insures a tender meat dish.

A7. Swiss steaks are pounded before they are cooked to (para 10a)

a. increase the flavor.

b. decrease shrinkage.

c. break the connective tissue and insure an easily browned steak.

d. break the connective tissue and shorten the cooking time.

A8. To control the palatability of beef stew, the vegetables should be (para 11a)

a. cut in pieces about the size of the pieces of meat.

b. added when the meat is tender.

c. precooked and added when the gravy is made.

d. cooked whole to retain their identity.

A9. The types of veal usually issued to dining facilities include (para 12)

a. roasts, steaks, and ribs.

b. roasts, steaks, and ground veal.

c. steaks, ground veal, and breast.

d. roasts, steaks, and cubed veal.

A10. To insure that roast pork and fresh roast ham are not overcooked, the meat should be removed from the oven when the (para 15a)

a. meat thermometer registers 170° F

b. meat thermometer registers 3° to 5° below the desired temperature.

c. meat has cooked 30 minutes per pound.

d. meat has cooked 45 minutes per pound when frozen.

A11. Which one of the following is true of cooked lamb? (para 19d)

a. Roasts should be sliced thinly as soon as they are removed from the oven.

b. Lamb should be served very hot to avoid hardened fat.

c. Chops dry out if they are broiled.

d. Roasts must be cooked well done.

A12. Fat fish are best for baking or broiling because (para 20)

a. the fat content prevents them from drying out during cooking.

b. the fat melts and the fish is more digestible.

c. the fat prevents the fish from frying well.

d. the fat causes the fish to brown evenly in the oven.

A13. The types of finfish and shellfish issued to the dining facility include (para 20 & 21)

a. canned crab, lobster, frozen fish fillets.

b. frozen fish steaks, frozen crab, oysters.

c. oysters, lobsters, and frozen fish steaks.

d. oysters, scallops, and frozen fish portions.

A14. What is one test for the proper doneness of baked finfish? (para 22b)

a. The fish should be golden brown.

b. The fish should be dry and flavorful.

c. The fish should flake easily when poked with a fork.

d. The connective tissues of the fish should be soft.

A15. The types of poultry issued to dining facilities include (para 27 & fig. 21)

a. broiler-fryers, capons, and turkeys.

b. turkeys, broiler-fryer chickens, and ducks.

c. turkeys, geese, and chickens.

d. canned, boneless, and whole turkeys, broiler-fryer chickens, and capons.

A16. To insure that deep-fat-fried chicken is done, (fig. 23)

a. cook it until the largest pieces are golden brown.

b. cook it until the temperature of the fat reaches 375° F.

c. cook the largest pieces, the breasts, for 5 to 7 minutes.

d. cook until "fork-tender."

A17. To help control the quality of chicken pot pie and other chicken and vegetable dishes, the vegetables should be (para 31e)

a. sliced thin and added to the chicken in a raw state.

b. sautéed in a little butter to add flavor.

c. cooked in liquid until well done.

d. cooked in liquid only until tender.

A18. Placing tinfoil tightly over a roasting turkey which is browning too rapidly is not recommended because (para 33b)

a. steam will be created, and the bird will be cooked by moist heat.

b. the skin will not be tender and flexible.

c. the drippings in the pan will be light in color.

d. the foil will prevent the thighs from cooking as quickly.

A19. While a duck is roasting, no basting is required because (para 34)

a. liquids are added to the pan at regular intervals.

b. the duck will be glazed when the meat thermometer reaches 170° F.

c. the meat is very fat, and as the fat melts it continually bastes the meat.

d. the moisture content of the meat is sufficient to keep the finished product moist.

SITUATION Exercises 20 through 22 are matching exercises. Column I lists statements concerning preparation of frozen cuts of meats; column II lists the cuts of meat. Select the cut of meat in column II to which the statement in column I applies and indicate each answer by writing the column II letter below the column I number. The cuts of meat in column II may be used once, more than once, or not at all.

Column I		Column II	
A20.	Unless it is thawed before it is cooked, it requires about 1/3 to 1/2 more cooking time. (para 3)	a.	Pork butt.
		b.	Roast.
		c.	Beef steaks.
A21.	It must be thoroughly thawed before it is cooked. (para 3)	d.	Ground meat.
A22.	Must be thawed before they, are grilled. (para 3)		

REQUIREMENT. Exercises 23 through 29 are matching exercises. Column I lists statements pertaining to the control of quality of. or the standard for cooking meat items; column II lists methods of cooking. Select the method in column II to which the statement in column I applies, and indicate each answer by writing the column II letter below the column I number. Methods listed in column II may be used once, more than once, or not at all.

Column I	Column II
A23. Beef cooked rare by this method should have a bright rose-red center. (para 8b(5))	a. Simmering in water.
	b. Deep-fat frying.
A24. If beef cooked by this method is not well browned, it will tend to lose its color during the cooking process. (para 10a)	c. Braising.
	d. Roasting.
	e. Baking.
A25. When sausages are cooked by this method at high temperatures, the meat is not toughened but there is an excess loss in the size of the servings. (para 15a)	
A26. Even though pork slices (chops) are tender they are usually cooked by this method. (para 17)	
A27. If lean finfish are cooked by this method they should be basted often with butter or margarine to prevent a dry product. (para 22a(l))	
A28. When cut-up chicken is cooked by this method, the breasts require longer cooking than the wings do. (para 30 & fig. 23)	
A29. When boneless turkeys cooked by this method are done, the meat thermometer registers a lower internal temperature than is required for a bone-in turkey. (para 33)	

REQUIREMENT. Exercises 30 through 35 are matching exercises. Column I lists some characteristics of various types of meats. Column II lists types of meat. Select the type of meat in column II that has the characteristic in column I, and indicate each answer by writing the column II letter below the column I number. Types in column II may be used once, more than once, or not at all.

Column I		Column II	
A30.	Tile meat from more mature animals is less tender but usually more flavorful than that from younger animals. (para 5)	a.	Pork.
A31.	It contains a high amount of connective tissue and little elastin. (para 12)	b.	Beef.
A32.	Before it is cooked, it is pale, rosy beige in color. (para 12)	c.	Lamb.
A33.	It is the lightest in color of all meats. (para 13)	d.	Veal.
A34.	It is firm and fine grained, and its exterior fat is firm, white, and dry. (para 13 & 14)		
A35.	Most of its cuts are tender and can be broiled without becoming dry. (para 19)		

SITUATION. Exercises 36 through 38 are matching exercises. Column I lists some distinguishing characteristics of shellfish; column II lists the types of shellfish. Select the type of shellfish in column II that matches the characteristic in column I, and indicate each answer by writing the column II letter below the column I number. Each type in column II may be used once, more than once, or not at all.

Column I		Column II	
A36.	They have tender, white meat and they turn pink when cooked. (para 26a)	a.	Clams.
		b.	Oysters.
		c.	Scallops
A37.	Because their membrane bruise easily, a fork should not be used when preparing them. (para 26b(1) &(2))	d:	Shrimp.
A38.	They have cream-colored, very lean flesh that has a sweet, delicate flavor. (para 26c)		

REQUIREMENT. Exercises 39 through 50 are true-false. Record each answer by writing a T or an F next to the exercise number.

A39. Calf brains are one of the variety meats served in Army dining facilities. (para 2a)

A30. The principle of using low temperatures to cook meat also applies to frozen meats. (para 3)

A41. In addition to the boneless, frozen cuts of beef, frozen beef liver, corned beef, and dried beef are issued to dining facilities for the preparation of the daily menus. (para 6)

A42. Veal should be cooked to well done to insure tenderness. (para 12b)

A43. Pork chops issued to dining facilities are from young animal, are high in fat, and are usually tender; therefore, they are cooked by grilling. (para 13)

A44. Fish require a short cooking time at a low temperature. (para 21)

A45. Frozen, breaded shrimp and frozen, molded, breaded shrimp which have been thawed may be refrozen and cooked at a later date. (fig. 17)

A46.. If poultry is young and tender, it should be cooked by moderate heat only until medium rare. (para 27)

A47. Large chickens should be baked slowly to reduce shrinkage. (para 30)

A48. Fried chicken should be cooked until it has a brown crisp surface, tender skin, and juicy, tender flesh that is not greasy. (para 27)

A49. When frozen turkeys are to be roasted, they are placed in the oven and cooked 2 hours before the meat thermometer is inserted in the inside thigh muscle. (fig. 24)

A50. Road turkey should be sliced as soon as it is removed from the oven to insure even, clean slices. (para 33c)

HAVE YOU COMPLETED ALL EXERCISES? DO YOU UNDERSTAND EVERYTHING COVERED? IF SO, TURN TO THE END OF THIS LESSON AND CHECK YOUR ANSWERS AGAINST THE SOLUTIONS.

APPENDIX

REFERENCES

1. TECHNICAL MANUALS (TM)

10-412	Armed Forces Recipe Service

2. FIELD MANUALS (FM)

10-25	Preparation and Serving of Food in the Garrison Dining Facility

SOLUTION SHEET

PROGRAMMED REVIEW

A1.	d	A26.	c
A2.	a	A27.	e
A3.	d	A28.	b
A4.	c	A29.	d
A5.	a	A30.	b
A6.	b	A31.	d
A7.	d	A32.	d
A8.	a	A33.	a
A9.	b	A34.	a
A10.	b	A35.	c
A11.	b	A36.	d
A12.	a	A37.	b
A13.	d	A38.	c
A14.	c	A39.	F
A15.	b	A40.	T
A16.	d	A41.	T
A17.	d	A42.	T
A18.	a	A43.	F
A19.	c	A44.	T
A20.	b	A45.	F
A21.	d	A46.	F
A22.	c	A47.	T
A23.	d	A48.	T
A24.	c	A49.	F
A25.	e	A50.	F

LESSON 4 **Credit Hours: 3**

LESSON ASSIGNMENT

SUBJECT	Basic Food Preparation: Salads, Salad Dressings, and Relishes; Sandwiches; Sauces, Gravies, and Dressings: Soups; and Vegetables.
STUDY ASSIGNMENT	Lesson Text.
SCOPE	Methods of preparing and serving salads, sandwiches, sauces, gravies, dressings, soups, and vegetables; methods of controlling quality of items in preparation; judging quality of finished product; identification of vegetable groupings.
OBJECTIVES	As a result of successful completion of this assignment, you will be able to—

1. List the methods used to prepare and serve:
   a. Salads.
   b. Sandwiches.
   c. Sauces, gravies, and dressings.
   d. Soups.
   e. Vegetables.
2. List the methods for controlling the quality of the items covered in this lesson.
3. State the standards used in judging the quality of the items covered in this lesson.
4. Identify the three types of salad dressings, and list the kind of salad with which each type is used.
5. Identify the three classes of sauces, and state the foods with which each is used.
6. List the vegetable groupings, and identify the best method of cooking for each group.

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LESSON TEXT

SECTION I

SALADS, SALAD DRESSINGS, AND RELISHES

1. SALADS. Salads are included in the menu for a number of reasons: Their crispness is a pleasant contrast to the soft foods of the meal, usually they are slightly tart and peppy and perk up the appetite for the other foods of the meal, and their color and form are pleasing to the sight and to the appetite. Salads, which may consist of vegetables, fruit, meat, poultry, eggs, or fish, are served cold with a dressing. Note. In the Armed Forces Recipe Service, recipes for salads made from meat, eggs, poultry, and fish are found in the section with the main ingredient; for example, the recipe for tunafish salad is given in section L, Meats, Fish, and Poultry. Some of the recipes in section M, Salads and Salad Dressings, are apple, cabbage, carrot, chef's, cole slaw, fruit, jellied fruit (fig. 1), lettuce, three bean, and waldorf, Salad greens are used in almost all salads as the main ingredient, as an underliner, or as a garnish. They provide color, flavor, and a crisp texture, and they are high in essential nutrients and low in calories.

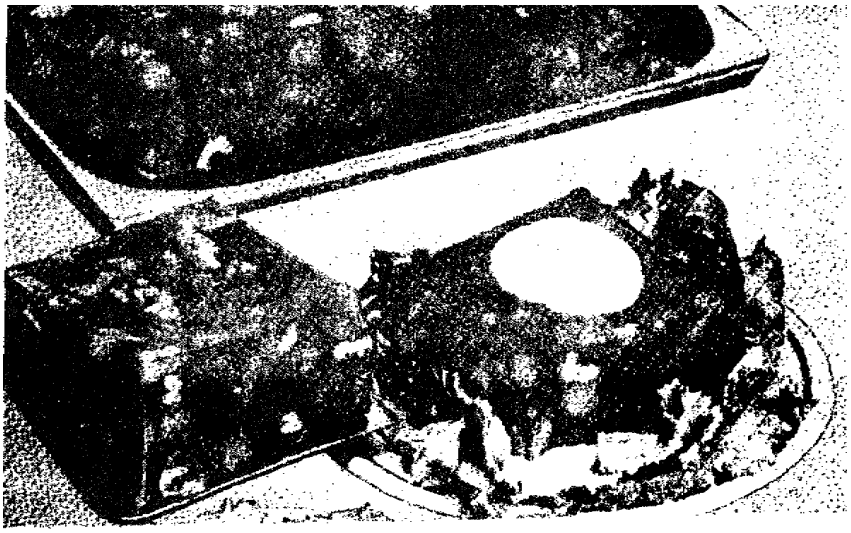
a. SUGGESTIONS FOR CONTROL OF QUALITY. Figure 2 gives guidelines for preparing salad greens as prescribed by Armed Forces Recipe Service. Each recipe gives specific instructions for preparing the specific salad and provides required notes for control of the quality. Fruits that are to be peeled and sectioned, sliced, or diced should be arranged directly on the salad plates or in bowls for immediate service, or be arranged on a shallow tray lined with a sheet of wax paper. A second sheet of paper should be placed over the fruit and the fruit stored in the refrigerator until serving time. Jellied fruit and vegetable salads are prepared in the same manner as gelatin desserts. When a large number of individual salads are being made up, an assembly-line system should be used. The plates or bowls are lined up, lettuce is added to line the dishes, and one ingredient at a time is added to each dish in the line. Mixed salads are mounded or molded to give the finished product form. However, if the finished product appears too fixed or too ornate, it lacks eye appeal. The following suggestions should help to achieve an attractive, crisp, and cold salad which is suitable in flavor and kind for the meal it accompanies.

(1) Keep in mind that salads are a work of art and should always be attractive to the eye.

(2) Use the lettuce as underliner for the salad to frame the salad plate and to add to its appeal. The lettuce should not extend over the rim of the plate.

(3) Place emphasis on the creation of a simple, palatable, colorful combination of ingredients. Avoid a conflict of strong flavors or colors, an unpleasant blandness of taste, a flatness of color, or a sameness of texture.

(4) When mixing vegetables or fruits, toss them together lightly to avoid crushing or mashing them.



Jellied fruit

Fresh fruit

Carrot raisin

Figure 1. Three types of salad (jellied fruit, fresh fruit, and carrot raisin).

M-G. SALADS, SALAD DRESSINGS, AND RELISHES No. 1

GUIDELINES FOR PREPARING SALAD VEGETABLES

Keep salad vegetables cold at all times. Do not remove from shipping container unless they are needed within 24 hours. When vegetables are removed from shipping container, they should be trimmed, washed, drained, placed in a covered container and refrigerated as quickly as possible. Never allow vegetables to stand at room temperature for any length of time.

PREPARATION GUIDELINES FOR LEAFY SALAD VEGETABLES:

1. Sort, trim, and discard damaged and decayed leaves. Keep as many outer leaves as possible to make the salad attractive and nutritious.
2. Core, stem, separate, and wash salad greens. Fill sink ⅔ full of cool water (add 1 tbsp salt per gallon if greens contain insects). Do not leave greens in water more than 6 to 7 minutes. Wash greens by lifting up and down in excessive amount of water. Soak wilted greens in ice water 10 minutes or in a solution of a half-cup of vinegar to each gallon of water for 30 minutes until crisp.
   a. Iceberg lettuce should have the core removed except when it is to be shredded or used for wedges. Remove the core by hitting each head (core side directly down) on counter; lift or twist out core; or cut out with stainless steel knife to prevent discoloration of cut edges.
   b. Cabbage should be cut in quarters and hard core removed.
   c. Romaine, endive, and escarole should have only the base core removed and leaves separated.
   d. Parsley should have stems removed.
3. Drain greens well of excess water. Invert heads of lettuce (core side down) to drain.
4. Tear or cut salad greens into bite size pieces or as otherwise directed on recipe card. Reserve outer iceberg lettuce leaves for individual salads.

PREPARATION GUIDELINES FOR NON-LEAFY SALAD VEGETABLES:

Carrots—Wash and scrub thoroughly to remove dirt; trim tops; scrape or peel.
Celery—Separate branches from stalk; wash thoroughly; trim bruised or blemished parts, heavy strings or midribs and leaves.
Celery hearts—Separate branches; wash thoroughly; do not trim leaves.
Cucumbers—Wash and peel.
Green onions—Separate bunches. Remove wilted tops, outer layer of bulb, and root end and wash.
Onions—Peel off outer skin. Trim ends.
Sweet peppers—Wash; remove stems and seeds.
Radishes—Wash thoroughly; trim tops and blemished parts. DO NOT PEEL.
Tomatoes—Wash; cut out stem end. If desired, tomato skin may be removed by dipping in boiling water, about 30 seconds, then into cold water. Pull loosened skins off with small paring knife.

Dice, grate, chop, shred, slice, cut in wedges or as otherwise directed on specific recipe card. Cut tomatoes in slices or wedges shortly before serving. Radishes, carrots, celery, and cucumbers may be crisped in ice water. Drain.

STORAGE:

Refrigerate well-drained, prepared salad vegetables on rack in covered containers, or in plastic bags at least one hour to crisp before individual salad make-up or placing on salad bar for "do-it-yourself" salads. If greens are to be held, drain excess water from pans or from bags (punch holes in bottom) placed in pans.

Figure 2. Guidelines for preparing salad greens.

(5) Break, cut, dice, or slice the salad ingredients into pieces large enough to be distinguishable, but not so large that they cannot be cut or eaten easily. Two exceptions to this general rule are that cabbage is more acceptable if shredded and fruits and vegetables are cut smaller for molded salads.

(6) If cooked vegetables are used, slightly undercook them to retain their texture. Thorough chilling and marinating of vegetable enhance the flavor of the finished product.

(7) When preparing jellied salads, allow the gelatin solution to stand at room temperature 1 1/2 hours, and then put it in the refrigerator. This procedure produces a gelatin dish with a texture usually superior to one that is wholly cooled in the refrigerator.

(8) Cover stored salads to prevent them from drying, from absorbing odors, and from giving off odors.

(9) Use a stainless-steel knife for cutting foods that discolor rapidly such apples, bananas, and avocados. Sprinkle these foods with lemon or other citrus juice, or quickly combine them with some acid fruit, to prevent them from turning brown.

(10) Tomatoes or citrus fruits should be the last ingredients added to a tossed salad. These acid foods tend to make other ingredients soggy and to wilt crisp greens if allowed to stand in the salad.

b. JUDGING THE QUALITY. Salads should have the desired flavor, a pleasing appearance, and a good texture. Salads should not be so large that the salad greens hang over the edge of the plate. A jellied fruit or vegetable salad must have clear-cut edges; a firm and delicate, but not rubbery, texture; and definite, but not rigid, form. The ingredients should be fresh and cold; the green raw vegetables and fruits should be crisp. Carrot pieces should have no brown skin, and greens should have no brown or reddish areas.

2. SALAD DRESSINGS. The three general types of salad dressings are french, mayonnaise, and cooked dressing. French dressing is prepared by forming either a permanent or a temporary emulsion. In a permanent emulsion, the oil is held in suspension by the use of egg yolks or a combination of yolks and whole eggs. Oil is dripped slowly into vinegar and flavoring ingredients to form a temporary emulsion. The permanent emulsion is thicker than the temporary emulsion and it coats the salad ingredients better; the temporary kind must be stirred thoroughly or be shaken before serving. Mayonnaise, mayonnaise dressing, and mayonnaise salad dressing are semisolid dressings which are prepared by forming an emulsion of salad oil and beaten egg yolks. Mayonnaise is used as the base for many other very popular dressings such as thousand island, russian, and lamaze. Prepared french dressing and mayonnaise are issued to dining facilities. Cooked dressing is used in the preparation of some cole slaws; it has a white sauce base with seasonings, vinegar, sugar, and usually egg. Usually two or three different salad dressings should be offered at each meal. The dressing is put in bowls, placed in the serving line, and labeled to indicate the kind. Care should be taken to select dressings that complement the salads (table 1) on the menu. The dressings are arranged so that the different colors present an eye-appealing tray; it is wise to group colors instead of jumbling them together.

3. RELISHES. Recipes in the Armed Forces Recipe Service for relishes served in Army dining facilities include cabbage, cranberry orange, and corn. Pickle relish is an issue item. Relishes are served with meat or fish; they may also be used to vary salad dressings and to add flavor to sandwich fillings. Raw vegetables may be served as crisp, colorful relishes. Figure 3 gives guidelines for using these items on relish trays or salad bars. Relish trays and salads are not included on the same menus. The self-service salad bar is a popular type of salad service. The raw fruits and vegetables can be kept colder and therefore stay crisp and fresh longer. The various salad selections should be arranged so that the troops do not have to reach over one food item to get to another. Frequent replenishment of salad materials are necessary, because these foods cannot be held for long periods in open air without losing quality.

Table 1. Salads with accompanying salad dressings

Salads	Salad Dressings
FRUIT SALADS	
Waldorf	Salad dressing, cooked dressing.
Fruit or mixed fruit	Salad dressing, cooked dressing, sour cream, french.
Pineapple cheese	Salad dressing, cooked dressing, sour cream, french.
Banana	Salad dressing, cooked dressing, sour cream.
Apple, celery and date	Salad dressing, sour cream, french, blue cheese, blue cheese-sour cream.
Orange and grapefruit	Salad dressing, cooked dressing, sour cream, french.
VEGETABLE SALADS	
Three bean	Salad dressing, french, thousand island, lamaze, sour cream, vinegar and oil, blue cheese, russian, vinaigrette, blue cheese-sour cream, chiffonade.
Tossed tomato and cucumber	Salad dressing, french, thousand island, lamaze, sour cream, vinegar and oil, blue cheese, russian, vinaigrette, blue cheese-sour cream, chiffonade, piquant.
Vegetable	Salad dressing, french, thousand island, lamaze, sour cream, vinegar and oil, blue cheese, russian, vinaigrette, blue cheese-sour cream, chiffonade, piquant.
Vegetable or cole slaw	Salad dressing, cooked dressing, vinaigrette.
LEAFY GREEN SALADS	
Tossed green and tossed vegetable	French, thousand island, lamaze, sour cream, vinegar and oil, blue or roquefort cheese, russian, vinaigrette, blue cheese-sour cream, chiffonade, piquant.
Spring	French, thousand island, lamaze, sour cream, vinegar and oil, blue cheese, russian, vinaigrette, blue cheese-sour cream, chiffonade, piquant.
Chef's	French, thousand island, lamaze, sour cream, vinegar and oil, blue cheese, russian, vinaigrette, blue cheese-sour cream, chiffonade.
GELATIN SALADS	
Perfection	Salad dressing, cooked dressing, sour cream, french.
Spicy cherry	Salad dressing, cooked dressing, sour cream, french.
Cranberry-orange	Salad dressing, cooked dressing, sour cream.
Golden glow	Salad dressing, cooked dressing, sour cream.
Jellied spring	Salad dressing, cooked dressing, sour cream, thick french.
Jellied fruit	Salad dressing, cooked dressing, sour cream.
Jellied waldorf	Salad dressing, cooked dressing, sour cream.
Pear	Salad dressing, cooked dressing.

GUIDELINES FOR RELISH TRAYS OR SALAD BARS

Crisp, colorful relishes may be presented on relish trays or salad bars. One or two raw vegetable relishes (celery sticks, carrot sticks, or radishes) and pickles, pickled peppers, or olives may be used. Salad greens may be added for "make your own" salads. Prepare fresh vegetables in accordance with Guidelines for Preparing Salad Vegetables (Recipe Card M-G-No. 1). Prepared relishes should be placed in covered containers in refrigerator until served.

ITEM	PORTION SIZE	100 PORTIONS	
		A.P. or Container	E.P.
Carrots, fresh, strips (4 by ½-inch)	6 strips	8 lb	6 lb 10 oz
Celery, fresh, sticks or strips (½-inch)	4 strips	9 lb	6 lb 12 oz
Crabapples, spiced, whole	1 crabapple	2-No. 10 cn	6 lb 14 oz (DW)
Cucumbers, fresh, pared, sliced	4 slices	9 lb	7 lb 9 oz
Endive, escarole, or romaine, fresh	variable	6 lb	4 lb 7 oz
Lettuce, head, fresh, trimmed, separated	variable	5 lb 8 oz	4 lb
Olives, green, unpitted	3 olives	3¾-1 qt jar	4 lb 15 oz (DW)
Olives, ripe, unpitted or pitted	3 olives	6¼-No. 300 cn	2 lb 15 oz (DW)
Onions, dry, chopped	¼ cup	9 lb	8 lb 3 oz
Onions, dry, sliced	3 to 4 slices	7 lb 3 oz	6 lb
Onions, green, whole	1 green onion	3 lb 10 oz	2 lb 6 oz
Peppers, pickled, cherry, whole	1 to 2 peppers	1½-gal jar	6 lb 12 oz (DW)
Peppers, pickled, jalapeno	1 to 2 peppers	2-No. 10 cn	8 lb (DW)
Peppers, sweet, fresh, strips	variable	6 lb 8 oz	5 lb 5 oz
Pickles, cucumbers, dill, whole, cut in sticks (6 per pickle)	4 sticks	2-1 gal jar	10 lb 7 oz (DW)
Pickles, cucumber, sweet, whole	1 to 2 pickles	2-No. 10 cn	9 lb 1 oz (DW)
Pickles, mixed sweet	3 to 4 pickles	1 gal jar	5 lb 15 oz (DW)
Radishes, fresh	3 radishes	7 lb 8 oz	7 lb 3 oz
Tomatoes, fresh, cherry	2 to 3 tomatoes	7 lb	
Tomatoes, fresh, quartered	2 quarters	20 lb	18 lb
Tomatoes, fresh, sliced	2 slices	20 lb	18 lb

NOTE: 2½-No. 10 cn (10 lb 7 oz (DW)) canned pickles, cucumber, dill, whole or 1¼-No. 10 cn (6 lb 1 oz (DW)) canned pickles, mixed, sweet may be substituted for gal jar containers.

Figure 3. Guidelines for relish trays or salad bars.

SECTION II

SANDWICHES

4. GENERAL. Sandwiches are made of two or more pieces of bread, a spread, and a filling such as cheese, eggs, fish, meat, poultry, or vegetables. Figure 4 describes the types of sandwiches served in dining facilities. The breads can vary from plain white, rye, whole wheat, french, or raisin, to rolls, buns, or biscuits. Only the freshest breads available are used for making sandwiches. There are many occasions for serving sandwiches of different combinations. Their selection is dependent upon whether they are to be used for box lunches, for appetizers, or for the main part of the meal. Because sandwiches are savory foods in a convenient form, they may be served in the field, on troop trains, and to small detachments on special assignments away from the regular dining facility.

5. PREPARATION. Figure 5 gives guidelines for preparing sandwiches for Army consumption; figure 6 gives some variations of sandwich spreads. When large quantities of sandwiches are to be made, the ingredients should be arranged within easy reach of and directly in front of the worker. The bread is placed in rows, and the sandwiches are made assembly-line fashion. The following equipment should be handy: spoon or scoop for portioning spreads; sharp knife for trimming and cutting; spatula for spreading butter, margarine, and filling mixtures; pans for storage if necessary; and damp towels. If the sandwiches are to be stored, they are wrapped in wax paper or put in sandwich bags.

a. SUGGESTIONS FOR CONTROL OF QUALITY. The following are additional guidelines for controlling the quality of sandwiches:

(1) Prepare the fillings just before using them, if practical; keep them refrigerated until time for use.

(2) Arrange meat or cheese so it covers the bread but does not extend over the edge of the bread.

(3) Avoid using ground-meat fillings or egg fillings in hot weather.

(4) Do not use sandwich fillings or spreads containing mayonnaise, ground meats, or chopped egg, for box lunches.

(5) Cook meats such as roast beef to an internal temperature of 185° F. to prevent food poisoning by certain bacteria.

b. JUDGING THE QUALITY. Good sandwiches are moist without being wet, and they have generous fillings which extend to the edges of the bread. Box-lunch sandwiches should have two matched pieces of bread. When served, the bread or roll should look, feel, and taste fresh. Grilled and french-toasted sandwiches should be golden brown without any burned areas (fig. 7).

SANDWICH VARIATIONS

1. "BOX LUNCH" SANDWICH: 2 slices of bread, spread with butter or margarine and a filling. The sandwich is cut in half for convenience in eating from the hand.
2. CLUB SANDWICH: 3 or more slices of bread, spread with butter or margarine and put together with a different filling in each layer. Crusts are usually trimmed. Sandwich is cut in triangles. Toothpicks are used to hold layers together, if necessary.
3. GRILLED OR TOASTED SANDWICH: 2 slices of bread filled with desired filling (cheese is often used). The whole sandwich is grilled on a lightly greased griddle (375° F.) or is placed on a sheet pan and toasted in a 475° F. oven. Serve hot.
4. FRENCH TOASTED SANDWICH: The whole sandwich is dipped in egg and milk batter then in bread crumbs before browning in deep fat fryer at 375°F. or on well greased 375° F. griddle. Serve hot. Crumbs are optional.
5. HOT SANDWICH: 2 slices of bread or toast placed on a plate with hot sliced meat. Gravy or sauce is poured over the sandwich.
6. OPEN-FACE SANDWICH: 2 slices of bread, spread with butter or margarine are topped with any desired sandwich spread or covered with sliced meat, cheese, tomato, etc.
7. SUBMARINE SANDWICH (Hero, Hoagie, or Poor Boy): A loaf of French bread or a hard roll is cut in half lengthwise; each half is spread with butter or margarine. On bottom half, layers of thinly sliced salami, sharp cheese, ham, tomatoes, and lettuce are arranged. Sandwich is covered with the top half and cut into portions.
8. "SLOPPY JOE" SANDWICH: Barbecued ground beef spread between a horizontally split sandwich bun.

Figure 4. Sandwich variations.

GUIDELINES FOR SANDWICH PREPARATION

Sandwiches may be served hot or cold, closed or open-faced. Variation in the bread or rolls will provide variety in flavor, texture, size, and shape. Enriched white, rye, whole wheat, pumpernickel, French, raisin and Italian breads, plus hamburger, soft and hard rolls can be used in sandwiches, since bread with a relatively firm texture makes good sandwiches for eating out-of-hand without bending or losing filling. Butter or margarine coats the bread and prevents soggy sandwiches.

DIRECTIONS FOR MAKING SANDWICHES

Pre-preparation

1. Have sandwich counter, tools and equipment clean and sanitary.
2. Following recipe card, have all ingredients ready to use:
   Soften butter or margarine by letting it stand at room temperature. DO NOT MELT.
   Wash lettuce thoroughly; core, separate leaves, drain, and crisp.
   Evenly slice foods such as tomatoes, cheese, and meats. Cross-stack sliced ingredients such as cheese and meat for quick and easy pickup.
   Prepare mixed sandwich fillings.
3. Allow plenty of space to work.
4. Assemble all equipment and ingredients in advance and place within easy reach toward back of counter.
5. Arrange ingredients in the order to be used.

Sandwich Assembly

1. Using both hands grasp bread slices, rolls or buns and lay in two rows.
2. With narrow spatula spread butter or margarine to edges of bread with one sweeping motion. Place sliced filling or scoop of mixed filling in center of each slice.
3. Use a stroke of the spatula away from you and a stroke towards you to spread filling evenly to edges of bread.
4. With both hands, grasp bread, rolls, or buns and drop over each filled slice matching edges.
5. Repeat Steps 2 through 4 stacking sandwiches.
6. Hold sandwiches together with thumb and first finger of left hand. Cut through one stack at a time with a sawing motion. Place in glassine bags, plastic wrap, waxed paper, or in pans with covers. Refrigerate until ready to serve or for grilling.
7. DO NOT add tomatoes or lettuce to sandwiches until just before serving. For box lunches, wrap tomatoes and lettuce separately.
8. Serve sandwiches the same day they are made.

SANDWICH HANDLING PRECAUTIONS

1. Make prepared fillings only in such quantities as will be used during one serving period. Avoid leftovers. Chill meat, fish, poultry, and egg fillings thoroughly before spreading on sandwiches. DO NOT HOLD these fillings at room temperature for more than three hours from preparation to consumption.
2. Handle bread and fillings as little as possible during preparation. Avoid the use of hands in direct contact with foods if tools or equipment can do the job efficiently.
3. Avoid stacking sandwiches for refrigeration more than 3 high as this insulates the filling and prevents it quickly reaching and maintaining the desired temperature.
4. Sandwich mixes or spreads with salad dressings, ground meat, or chopped eggs should not be used for box lunches or ground feeding bag meals.

Figure 5. Guidelines for sandwich preparation.

SANDWICH SPREAD VARIATIONS

Soften butter or margarine in a covered container at room temperature until it can be spread with a spatula evenly over a slice of bread. DO NOT MELT BUTTER OR MARGARINE. Use 2 lb softened butter or margarine to spread bread for 100 sandwiches.

SEASONINGS FOR BUTTER OR MARGARINE

To 1 lb of softened butter or margarine, add any one of the ingredients listed below. Chill, if necessary, for proper spreading consistency.

Ingredients	Amount	Ingredients	Amount
Catsup or Chili Sauce	½ cup	Mustard, ground	1 tablespoon
Celery, fresh, minced	½ cup	Mustard, prepared	1½ tablespoons
Cheese, soft or grated (Cheddar, Parmesan, Romano)	¼ to ½ cup	Olives, chopped	4 tablespoons
		Onions, dry, grated	1½ tablespoons
Cucumbers, fresh, minced	½ cup	Parsley, fresh, chopped	½ cup
Horseradish	1 tablespoon	Peppers, sweet, fresh, chopped	½ cup
Juice, lemon	2 tablespoons	Pimientos, canned, chopped	¼ cup
Lemon rind, grated	1 tablespoon	Relish, pickle, sweet, drained	½ cup
		Worcestershire sauce	1 tablespoon

Figure 6. Sandwich-spread variations.

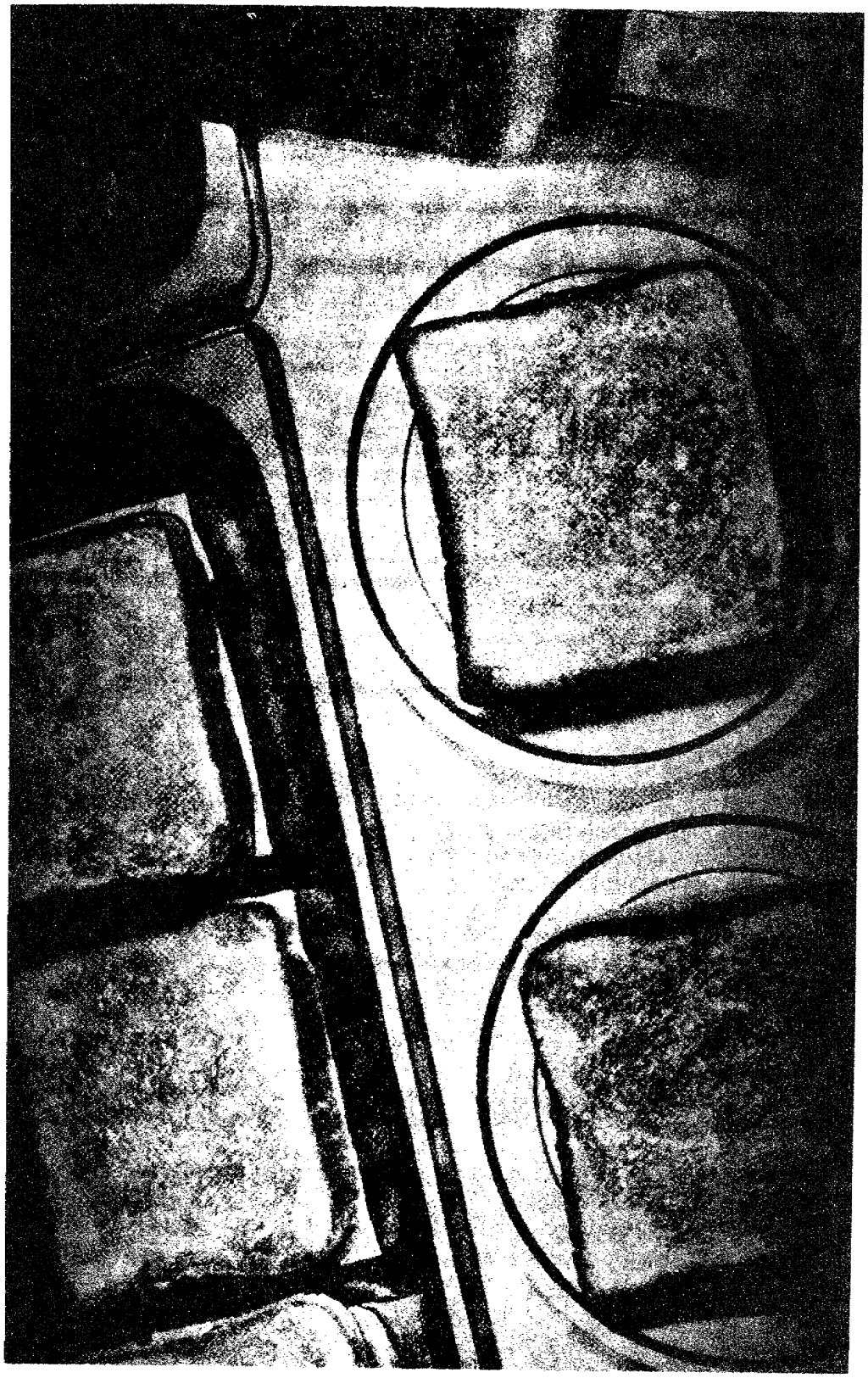


Figure 7. Grilled cheese sandwiches.

SECTION III

SAUCES, GRAVIES, AND DRESSINGS

6. SAUCES. Sauces are rich-flavored, thickened liquids served with food dishes to enhance the acceptability of the foods (table 2). The food dishes may be meat, vegetable, egg, fish, poultry, or dessert dishes. When a sauce has as an ingredient the drippings of the meat it is to accompany, it is usually called a gravy (para 7). Section O of the Armed Forces Recipe Service gives instructions for preparing sauces for foods other than desserts, which are covered in Section K. The sauce should flow over the food and provide a thin coating, rather than a heavy mass that disguises the dish. Sauce does not always contain the same flavor as the item it accompanies; a contrast in flavors is often desirable. Sauces other than dessert sauces are classed as warm, cold, and butter. Most warm sauces are made from stock; the richer the stock is, the better the sauce. An exception is cream sauce (fig. 8) which is made with milk. Cold sauces are blended from many different foods, the most popular of which is mayonnaise, also called a dressing. The difference between the terms "sauce" and "dressing" is very slight; "sauce" is associated with a thickened liquid which enhances the flavor of meats and vegetables, and "dressing" is used to enhance salads. Mayonnaise or mayonnaise salad dressing is used as the base for tartar sauce and for other sauces that may be used with either hot or cold foods. Butter sauces increase the flavor and moistness of the dishes they accompany and give the dishes a sparkling, fresh-looking sheen.

a. SUGGESTIONS FOR CONTROL OF QUALITY. Figure 9 gives guidelines for preparing sauces and gravies, from the Armed Forces Recipe Service. The following precautions and suggestions should help to insure that the sauces improve the dish with which they are served:

(1) When simmering the sauce, be careful not to scorch it.

(2) If vegetables such as celery and onions are used in making the sauce, do not let them brown.

(3) If spices such as bay leaf and whole cloves are used to make the sauce, remove them after the sauce or gravy is prepared because they will continue to disperse flavor.

(4) When melting the butter, do not let it brown or burn.

(5) Do not let a brown sauce become too thick.

(6) When making a roux, be careful that the shortening and flour do not scorch. Whip constantly when adding milk to obtain a smooth sauce.

(7) When making mock-hollandaise sauce, add the egg yolks to a little hot cream sauce to warm the egg yolks; then add the warm mixture to the hot cream sauce very slowly, and whip briskly. Since this sauce is very rich, a small portion is adequate.

Table 2. The basic sauces

Variety of sauce or gravy	Color	Basic ingredients	Thickening agent used	Use
Cream or white	White	Milk, flour, fat	Roux	General purpose, meat, fish, vegetable
Cream gravy	White or colored	Meat drippings milk, flour	Roux	General purpose, meat, fish
Brown gravy	Brown	Browned stock, browned flour, fat	Roux (brown)	Meats, poultry
Pan gravy	Brown	Meat drippings	Natural	Meats (beef)
Tomato	Red	Tomato stock fat, flour	Roux	General purpose, fish, vegetables, paste products
Mock-hollandaise	Yellow golden	Melted, butter eggs, lemon juice	Egg yolks	Eggs, fish, vegetables
Mayonnaise and salad dressing	Yellow golden	Starch, oil, egg yolk	Egg yolks (starch or cooked dressing)	Salads, general purpose
Lemon butter	Various colors	Butter or margarine, parsley, lemon	None	General purpose, meat, fish, poultry, vegetables
Special or commercial sauces	Various colors	Vegetables, vinegar	Gums or pectin stabilizers	General purpose
Dessert sauces	Any color	Milk and/or fruit juices	Starch or stabilizers	Desserts

DIRECTIONS FOR MAKING CREAM OR WHITE SAUCE

INGREDIENTS	WEIGHTS	MEASURES		COLD ROUX METHOD
THIN (1 Gal)				1. Blend butter or margarine and flour together; stir until smooth.
Butter or margarine, melted	8 oz	1 cup		
Flour, wheat, hard, sifted	4 oz	1 cup		
MEDIUM (1 Gal 12 Oz)				
Butter or margarine, melted	1 lb	2 cups		
Flour, wheat, hard, sifted	8 oz	2 cups		
THICK (1 Gal 24 Oz)				
Butter or margarine, melted	1 lb 8 oz	3 cups		
Flour, wheat, hard, sifted	1 lb	1 qt		
Milk, nonfat, dry	13 oz	2⅞ cups		2. Reconstitute milk; heat to just below boiling. DO NOT BOIL.
Water, warm		3¾ qt		3. Add roux to milk, stirring constantly.
Salt	1⅓ oz	2 tbsp		4. Add salt. Simmer 10 to 15 minutes or until thickened. Stir as necessary.

INGREDIENTS	WEIGHTS	MEASURES		WARM ROUX METHOD
THIN (1 Gal)				1. Melt butter or margarine over low heat.
Butter or margarine	8 oz	1 cup		2. Add flour gradually; stir with a wire whip until mixture is smooth. Cook about 15 minutes. Stir while cooking.
Flour, wheat, hard, sifted	4 oz	1 cup		
MEDIUM (1 Gal 12 Oz)				
Butter or margarine	1 lb	2 cups		
Flour, wheat, hard, sifted	8 oz	2 cups		
THICK (1 Gal 24 Oz)				
Butter or margarine	1 lb 8 oz	3 cups		
Flour, wheat, hard, sifted	1 lb	1 qt		
Milk, nonfat, dry	13 oz	2⅞ cups		3. Add dry milk and salt to roux; blend thoroughly.
Salt	1⅓ oz	2 tbsp		4. Add water gradually, stirring constantly.
Water, hot		3¾ qt		5. Simmer 5 to 10 minutes. Stir as necessary.

NOTE: 1. Dry milk may be added in Step 1 without first reconstituting; roux may then be added to warm water in Step 3.
2. Other types of milk may be used in Step 3. See Recipe Card A-9.

Figure 8. Directions for making cream or white sauce.

GUIDELINES FOR PREPARING SAUCES AND GRAVIES

Sauces and gravies are thickened liquids or stocks. They are served with meat, fish, poultry, vegetables, and desserts to add flavor, nutritive value, and garnish.

A. INGREDIENTS USED IN PREPARATION OF SAUCES AND GRAVIES:

1. *Liquids*—Vegetable juice, fruit juice, water, milk, meat or poultry stock may be used. Liquid and browned particles from meat drippings should be added to stock for flavor and color. In large quantity preparation, liquid should be just below boiling point when thickening agent is added because most starches thicken immediately in 180° to 190° F. liquids.

NOTE: When reconstituted nonfat dry milk is used, it is important to keep the temperature just below the boiling point as the proteins in milk tend to precipitate at boiling temperature and give the sauce a rough texture.

2. *Thickening Agents*

a. Roux is a French word for a mixture of flour and fat, usually cooked to eliminate the raw, pasty taste of uncooked flour.

(1) Light or Cold Roux—a smooth mixture of melted fat and flour. It may be cooked, but should not be browned.

(2) Brown Roux—a browned mixture of fat and flour. Flour is added to hot fat and cooked over low heat until a golden brown color is formed, about 10 minutes on top of range. Stir continuously to prevent scorching. Roux may also be browned in moderate oven 350° to 375° F. (about 30 minutes).

b. Paste or Slurry—a lump free mixture made by whipping cornstarch or flour into cold water or other liquids.

3. *Fats*—Fat gives flavor, body, and a finish to sauces and gravies. The fat is also valuable because it separates the starch granules and decreases the likelihood of lumps Whenever possible, use fat from meat or poultry drippings with which sauce or gravy should be served. Separate clear fat from meat or poultry drippings to use in roux. Do not use meat juice as it will cause lumps. Rendered fat, butter, margarine, or shortening may also be used.

B. METHODS USED IN PREPARATION OF SAUCES AND GRAVIES:

Sauces and Gravies should be cooked in a heavy sauce pan or double boiler or steam-jacketed kettle.

1. *Combining Sauces and Gravies*

a. *Roux and Slurry (Paste)*—When sauces or gravies are prepared in more than ½ gallon volumes, it is preferable to add the roux or slurry slowly to near boiling liquid, while stirring with wire whip. Following recipe directions, cook ingredients over low heat, stirring constantly until mixture is smooth, thickened, and no longer has a starchy taste.

2. *Prevention of skin on surface of sauce or gravy:* Cover with lid immediately or spread a thin film of melted butter, margarine, or shortening over surface. Whip thoroughly before serving.

3. *Reheating Sauces or Gravies*—Cold sauce will seem too heavy and will scorch easily over direct heat. If possible, reheat in double boiler or over hot water, stirring occasionally.

4. *Adjustments*—If sauce or gravy is too thin, sprinkle a small amount of potato granules into hot mixture, stirring constantly. A mixture of cornstarch and cold water may also be used. If sauce is too thick, thin with a small amount of hot liquid.

Figure 9. Guidelines for preparing sauces and gravies.

(8) When making tartar sauce, drain the chopped onions and pickles until they are fairly dry before adding them to the mayonnaise so that the sauce will not have a fluid consistency.

b. JUDGING THE QUALITY. A velvet texture, fine flavor, and proper consistency are the factors of a good sauce. A good consistency test is to submerge a spoon into the sauce, to raise it a little, and to turn the spoon over so the sauce will drain off; thin smooth coating should remain on the back of the spoon. If the sauce is too thick, it should be thinned with the original stock or with water. The sauce should have a slight sheen and should be smooth and free of lumps.

7. GRAVIES. Gravies are served with meat courses. Actually they are sauces, but since they must have the same flavor as the meat they accompany, they are called gravies rather than sauces. Because some of the vitamins and minerals of the meat cook out into the drippings, the drippings must be used in the gravy so that the nutritive value of the meat is not wasted. A good brown stock is used with the drippings to supplement the flavor and to increase the volume. The addition of the stock is particularly necessary for gravies of meats such as pork and veal, which have very delicate flavor. A good gravy has the characteristic flavor of the meat with which it is served. Beef gravy is delicious with roast beef, but not with roast pork. The color of the gravy varies according to the cooking method, the cooking temperature, and the kind of liquid used. Most people prefer a rich, brown gravy, except for chicken gravy. The following suggestions should help to insure a good gravy:

a. If stock is not available for making gravy, use beef bouillon cubes or soup and gravy base for making beef gravy, and use chicken bouillon cubes for making chicken gravy and other gravies.

b. Be careful not to season gravy too much because the drippings usually provide enough salt and pepper.

c. When other ingredients such as mushrooms, onions, chopped vegetables, and nuts are added to gravies, be sure that they complement and enhance the dish.

d. Deglaze the roast pan to recover all the meat flavor possible. (Deglazing is accomplished by adding water to a pan in which meat has been cooked to dissolve crusted juices that have dried on the bottom and sides of the pan.)

e. When adding the stock to a roux, be sure the stock is hot. Whip the mixture vigorously to eliminate lumps.

f. Stir gravy occasionally while it is simmering, to avoid scorching.

g. If fat floats on the top of cream gravy remove with spoon or ladle.

8. DRESSINGS. Dressings, which are seasoned mixtures of bread, spices, and other ingredients cooked separately, may be served with poultry, roasts or other meat items or with fish. "Stuffing," though used interchangeably with "dressing," is any seasoned preparation cooked with poultry, fish, or meat. There are many variations of the basic bread dressing, such as apple, giblet, oyster, raisin, and sausage dressings. A moist dressing is desirable, but it should not be heavy or pasty. The following suggestions should help to insure a good finished product:

a. Use only day-old bread and a rich stock. Use bread cubes, rather than crumbs, for a lighter dressing.

b. Sauté celery, onions, and other vegetables until slightly tender.

c. Blend all ingredients together, but do not overmix them.

d. Bake the dressing thoroughly; if a cold center remains after baking, the dressing easily spoils.

e. Measure seasoning accurately; although seasoning "makes" a dressing, an overestimated quantity can cause the item to be unacceptable.

SECTION IV

SOUPS

9. GENERAL. Soup is a liquid food consisting mainly of the broth of meat, seafood, or vegetables; it is usually served as an appetizer. A good stock is the basis for any tasty, flavorful, and nutritious soup. Stocks are light or brown and are further classified as bone, chicken (or poultry), meat, vegetable, and fish. Possibly the most common, most versatile, and cheapest of these is beef stock (fig. 10). A ratio of 4 pounds of crushed beef bones to 2 1/2 gallons of fresh cold water produces a very acceptable beef stock. If the bones are too large, the extraction of soluble material is less, because the heat does not easily penetrate and convert the collagen to gelatin. Brown stock is prepared by browning the bones before adding water. Similar stock is made with other varieties of bones, such as veal, lamb, and chicken. Fish stock is made with bones, heads, and bits of raw fish; fish stock can be properly made in about 1 hour. Vegetable stock is used for meatless soups or purees. The quality of the stock is improved with the addition of a "bouquet garni" which is usually composed of celery, parsley, carrot, onion, bay leaf, clove, and peppercorns. All stock should be defatted and strained before it is used for soups.

10. SOUP CLASSIFICATION. Soups are basically of two kinds: Light soups, which are thin or clear; and heavy soups, which are thick and hearty. A light soup is served before a heavy meal, and a heavy soup before a light meal. A few soups such as oyster stew or corn or seafood chowders may be heavy enough to be served as the main dish for a light meal.

a. LIGHT SOUPS. Light soups are composed of a clear, thin liquid, usually meat stock, plus miscellaneous cereal and vegetable ingredients. These soups are not heavy and are not thickened. Light soups are called consommé or bouillon when neither cereal nor vegetables are added. Beef, beef-barley, beef-noodle, chicken-noodle, chicken-rice, french-onion, creole, tomato-barley, and turkey-noodle soups are light soups.

b. HEAVY SOUPS. The major types of heavy soups are chowders, creamed soups, and purees. Heavy soups are thickened by cereals such as rice or barley, by starchy vegetables, macaroni, noodles, or dumplings, or by pureeing some or all of the vegetable ingredients. Roux is also used to thicken some soups such as split-pea soup, bean soup, and new england clam chowder. Oysters and scallops are made into stews rather than soups, but are classed as heavy soups even though they are prepared without any thickening agent and the liquid is relatively thin.

(1) CHOWDERS. Chowders are a special variety of hearty soup of which clam chowder is perhaps the best known. A chowder usually has milk as the major portion of the liquid; an exception is manhattan clam chowder which has creamed tomatoes as part of the liquid. Potatoes, onions, and bacon are usually among chowder ingredients.

BEEF STOCK P. SOUPS No. 1

YIELD: 100 Portions (6¼ Gallons) EACH PORTION: 1 Cup

INGREDIENTS	WEIGHTS	MEASURES		METHOD
Beef bones, cracked (if available)	22 to 30 lb			1. Place bones, beef trimmings, and water in kettle.
Beef trimmings	10 lb			2. Add vegetables, bay leaves, pepper, and salt. Cover and bring to a boil; reduce heat; simmer about 5 hours. Strain.
Water		7 gal		
Carrots, fresh, chopped	1 lb	3 cups		
Celery, fresh, chopped	1 lb	3 cups		3. Cool stock as quickly as possible. (Divide stock in two or more batches, if necessary, to hasten cooling.) Refrigerate until needed.
Onions, dry, chopped	1 lb	3 cups		
Bay leaves		3 leaves		4. Before using, remove layer of hardened fat from top of stock.
Pepper, black		1 tsp		
Salt	5 oz	½ cup		

NOTE: 1. If beef bones are not available, 1 lb 8 oz Soup and Gravy base, beef, may be used in Step 1. See Recipe Card A–12. Omit salt and season to taste.
2. 2 oz (⅔ cup) dehydrated onions may be used in Step 2. See Recipe Card A–11.

VARIATIONS

1. BEEF BARLEY SOUP: Add 3 lb (1½ qt) barley to 6¼ gal boiling stock. Simmer, stirring frequently, about 20 minutes or until barley is tender. Season to taste.
2. BEEF NOODLE SOUP: Add 1 lb (1½ qt) noodles to 6¼ gal boiling stock. Simmer, stirring frequently, about 15 minutes or until noodles are tender. Season to taste.
3. BEEF RICE SOUP: Add 2 lb (4⅔ cups) rice to 6¼ gal boiling stock. Simmer, stirring frequently, about 15 minutes or until rice is tender. Season to taste.

Figure 10. Recipe for beef stock.

(2) CREAMED SOUPS. Creamed soups usually have a base of a white sauce. Flour, an ingredients of the sauce, thickens the soup.

(3) PUREES. Purees are usually made from cooked peas, cooked beans, or cooked fresh vegetables which are put through a sieve and then added to seasoned stock. The vegetables may be cooked in stock and then purged.

11. COMMERCIALLY PREPARED SOUPS. Although soups prepared in the dining facilities are considered to be the desired ones, dehydrated soups are issued in the following varieties: Chicken noodle, onion, pea, and tomato vegetable. These soups usually require reconstitution with boiling water. Armed Forces Recipe Service contains a basic recipe to be used as a guide for rehydrating these soups; however, it is well to follow the instructions furnished by the manufacturer. If canned soups are issued, they may be either condensed or ready to serve. Condensed soups have 50 percent of the liquid removed; it is necessary to replace the removed liquid with water when heating the soup for serving. Ready-to-serve soups require no dilution; they need only be heated and served.

12. SOUP AND GRAVY BASE. When stock is not available for making soup, soup and gravy base may be reconstituted as outlined in figure 11 and used in the same manner as stock. Note. Season soup or gravy carefully, because the soup and gravy base is already well seasoned and because salt is one of the preservatives.

13. SPECIFIC POINTS ON MAKING SOUP. It is important in the preparation of fine soups that each step be performed as skillfully as possible. Skimming the fat and scum is essential to produce a clear stock. Some stocks and soups must be strained to remove undesirable particles that detract from the appearance and eating qualities of the soup. If the soup is to be thickened by a roux or other items containing starches, the same care must be exercised as that for making a thickened sauce.

a. SUGGESTIONS FOR CONTROL OF QUALITY. The following suggestions should be used when preparing soup:

(1) Use a strong flavorful stock; the soup is only as good as the stock used.

(2) Braise the vegetables slightly when preparing most soups, to produce a better flavor.

(3) Start cooking the soup sufficiently early for it to simmer slowly and to produce a pronounced flavor.

(4) Season soups moderately; more seasoning, as desired, can be added by the troops. Add pepper to soups just before serving them.

(5) Cut vegetables into small, evenly shaped pieces. Irregularly cut vegetables cook unevenly and detract from the appearance of the finished product.

(6) Do not add vegetables to the stock until the scum has been removed from the stock.

A. GENERAL INFORMATION No. 12

RECONSTITUTING SOUP AND GRAVY BASES

Beef Soup and Gravy Base and Chicken Soup and Gravy Base may be reconstituted and used as bouillon to extend natural meat juices, or as stock in recipes for soups, gravies, and sauces.

The powdered bases are seasoned and when reconstituted in boiling water will have the characteristic flavor and appearance of a Beef Broth or Chicken Broth. When used in preparing a recipe always check the seasoning before adding salt.

BASE		+ BOILING WATER
WEIGHT	MEASURE	
	2 tsp	1 cup
1 oz	2½ tbsp	1 qt
4 oz	10 tbsp	1 gal
8 oz	1—8 oz jar	2 gal
24 oz	1—No. 2½ can	6 gal

Figure 11. Information on reconstituting soup and gravy bases.

(7) When making thick soups, stir them occasionally with a wooden paddle to prevent sticking or scorching.

(8) Do not hold creamed soups and chowders at high temperatures, or they will curdle.

(9) Reduce the heat as soon as the liquid reaches the boiling point, and simmer the liquid. Rapid boiling reduces the liquid too much and breaks up or shreds the solid ingredients, making them unattractive.

(10) Add the vegetables to the meat stock at the time directed by the recipe. Observe cooking times carefully to avoid undesirable flavor from overcooking ingredients like cabbage, onions, and turnips.

(11) Add tomatoes carefully to the white sauce when making creamed soup to avoid curdling the sauce.

(12) Garnish the soup. Suggestions for garnishes are given in table 3.

Table 3. Suggestions for soup garnishes and seasonings

SOUPS	GARNISHES AND SEASONINGS
Bean soup	A pinch of chili powder; crisp chopped bacon; thin slices of frankfurters or stuffed olives; or chopped dill pickles.
Chicken soup	Curry powder; a pinch of ground ginger; grated coconut, toasted chopped almonds, a dash of lemon juice or thinly sliced lemon; crisp chopped bacon; pretzel sticks; pimento strips; thinly sliced, green onion tops or chives; or croutons seasoned with celery salt, lemon juice, and melted butter.
Consomme	A pinch of curry powder; garlic croutons; a dash of lemon juice; toasted squares with parmesan cheese; or thinly sliced carrots, cucumbers, or radishes.
Corn chowder	Finely chopped chives, thin slices of onion; chopped parsley; slightly beaten egg yolks; bay leaf; whole cloves; a dash of sage; or a sprig of thyme.
Creamed soup	Minced chives; chopped parsley; a pinch of curry powder; paprika; croutons; grated cheddar cheese; crisp chopped bacon; sliced stuffed olives; crushed potato chips; toasted squares with parmesan cheese; pretzel sticks; small cheese crackers; thinly sliced carrots, cucumbers; green pepper or radishes, dry crisp cereal, or toasted shredded almonds.
Onion soup	Grated american, parmesan, or swiss cheese; or Worcestershire sauce.
Pea soup	Crisp chopped bacon; bay leaf; a sprig of thyme; sprigs of fresh parsley; croutons; thinly sliced frankfurters; carrots, celery; stuffed olives or radishes; pimento strips; crushed potato chips; pretzel sticks; toasted squares with parmesan cheese; small cheese crackers, or dry crisp cereal.
Potato soup	Thin strips of bologna; thin slices of frankfurters; finely chopped bacon or ham; chopped celery, crushed garlic; chopped leeks; sprigs of fresh parsley; minced turnips; slightly beaten egg yolks; or croutons.
Tomato soup	Chopped carrots, celery, chives, leeks, or turnips; finely chopped cooked lean ham; a pinch of brown or white sugar; a pinch of fresh chopped basil or dill; croutons; grated american, parmesan, or swiss cheese; crisp chopped bacon; thinly sliced frankfurters, celery, green pepper, stuffed olives or lemon; crushed potato chips, pretzel sticks; chopped dill pickle; small cheese crackers; or dry crisp cereal.
Vegetable soup	Grated american, parmesan, or swiss cheese; crisp chopped bacon; chopped parsley; bay leaf; cloves; garlic; oregano; thyme; rice; fine noodles; green beans; thinly sliced frankfurters; cucumbers or lemon; crushed potato chips; pretzel sticks; dry crisp cereal; or croutons.

b. JUDGING THE QUALITY. If the vegetables are cut too large, the soup will be filling, which defeats the purpose of soup as an appetizer. Clear soups must be dear; creamed soups should not be too thin nor too thick to be palatable. Because there is a tendency to overseason soup, all soups must be only lightly seasoned to allow each person to season to his taste. Sautéed onions and celery and other vegetables used in the soup should be cooked only until they are soft and tender. To further enhance the flavors of soups, have crackers or croutons placed near the diners so that they may use them if they wish. The final requirement for a proper soup is that it be served hot.

SECTION V

VEGETABLES

14. GENERAL. Vegetables are an important part of the daily menu. The general classifications of vegetables are: Leafy; bulbs, roots, and tubers; flowers, buds, stems, and shoots; and seed. Some vegetables are eaten raw, but others are cooked to make them more digestible, more acceptable, and more palatable. Frozen, canned, fresh, dried, and dehydrated vegetables are issued to dining facilities for preparation of the daily menus. The methods of cooking vegetables-are boiling, baking, deep-fat frying, sautéing, and steaming. Figure 12 gives guidelines for cooking fresh vegetables by boiling. The guidelines list many vegetables that are usually issued as frozen items. For fresh vegetables, the cooking time listed in the guidelines should be used, since Armed Forces Recipe Service does not contain recipes for most fresh vegetables. Progressive cookery is used to insure that each man receives freshly cooked, nutritious, eye-appealing vegetables.

15. COMPOSITION OF VEGETABLES. The physical and chemical structure of vegetables must be understood for vegetables to be handled in a satisfactory manner.

a. NUTRITIVE VALUE. The principal contributions of vegetables to the diet are bulk, minerals, water, and vitamins. Leafy vegetables are a rich source of vitamins and minerals, and they average about 25 calories per serving when served without generous amounts of butter or other seasonings or sauces. Thick, dark-green leaves are extremely high in vitamin A. Many other leafy vegetables are especially valuable for vitamin C, calcium, and iron. Green, red, and yellow vegetables are high in vitamin A; tomatoes are high in vitamin C. Potatoes and legumes are rich in carbohydrates, which furnish an abundance of energy, or calories, to the diet. Fresh vegetables contain large quantities of water; for example, asparagus contains 93 percent water.

b. STRUCTURE. Fresh vegetables have an abundance of cellulose. Cellulose is the fibrous part of vegetables that furnishes essential bulk for the diet. Because cooking softens cellulose, the extent of cooking and the method chosen for cooking vegetables should be geared to the amount of cellulose present. Some parts, such as stems, of fresh or frozen vegetables contain more fiber than do other parts and, for this reason, require long cooking. Root vegetables, such as beets, are also fibrous and require longer cooking time than some other vegetables.

c. REFUSE. Most raw vegetables have waste material which is not edible. Fresh broccoli, for example, may contain up to 53 percent waste, and fresh corn on the cob, 62 percent. Tomatoes have less than 2 percent waste because the seeds, flesh, and skin of fresh tomatoes are eaten. Processed forms of vegetables, including canned, frozen, freeze-dehydrated, dried, and dehydrofrozen, have a greater amount of waste material removed from them than do fresh vegetables.

d. COLOR. Vegetables are of four color groups: Chlorophyll--green, anthocyanins--red and purple, flavones--pale yellow which turns white when cooked, and carotinoids--yellow and orange. Each color has distinct chemical compounds that have different properties. Each color must be preserved when the food item is cooked, or the item will be less acceptable (table 4).

GUIDELINES FOR COOKING FRESH VEGETABLES
(buttered)

YIELD: 100 Portions — EACH PORTION: See Below Portion Size

VEGETABLE	A.P. LB	E.P. LB	AMT OF WATER	COOKING TIME MINUTES (APPROX.)	PORTION SIZE
Asparagus	36	20	1½ gal	10 to 20	4 to 5 spears
Cabbage	25	20	3 gal	10	3 oz wedge
Carrots	25	20	2 gal	25	½ cup
Cauliflower	51	20	3 gal	12	3 to 4 flowers
Collards	27	20	2 gal	20 to 30	½ cup
Corn-on-the-Cob (100 ears)	55		To cover	5 to 10	1 ear
Kale	29	20	½ gal	10 to 12	½ cup
Onions	22	20	3 gal	15 to 20	½ cup
Parsnips	24	20	To cover	20	3 to 4 pieces
Potatoes, sweet	31	23	To cover	25 to 30	2 to 3 pieces
Potatoes, white	45	35	To cover	20 to 25	1 potato
Rutabagas	23	20	2 gal	20 to 30	½ cup
Spinach	25	18	½ gal	3 to 10	½ cup
Squash, Summer	25	24	½ qt	20	½ cup
Squash, Fall and Winter	28	20	¾ gal	15 to 20	1 to 2-inch pieces
Turnips	25	20	2 gal	20 to 30	½ cup

METHOD

1. Bring water to a boil in steam-jacketed kettle or stock pot.
2. Add 1 tsp salt for each quart of water.
3. Add vegetables (E.P.); bring water back to a boil. Cover; cook for the indicated time or until vegetable is just tender.
4. Drain; place vegetables in serving pans.
5. Melt 1 lb (2 cups) butter or margarine; pour an equal amount over vegetables in each pan. Garnish as desired.

NOTE: 1. Schedule cooking of fresh vegetables as near serving time as possible, never more than 20 to 30 minutes before serving.
2. Cook asparagus, collards, kale, spinach, and squash in quantities no larger than 50 portion batches.
3. To cook in steamer, place vegetables in pans. See Guidelines for Steam Cookers A-21. Proceed with Step 5.
4. Leftover liquid may be used in making soups, sauces, and gravies.

Figure 12. Guidelines for cooking fresh vegetables (buttered).

Table 4. Effects of various factors upon appearance of boiled vegetables

FLAVOR	COLOR BEFORE COOKING	PIGMENT THAT CAUSES COLOR	SOLUBILITY IN WATER	EFFECT OF HEAT ON COLOR	EFFECT OF ACID ON COLOR	EFFECT OF ALKALI ON COLOR	RECOMMENDATIONS FOR COOKING
Mild or sulphur containing	Green	Chlorophyll	Slightly soluble	Decomposes	Olive green	Intensifies	Water to cover, no cover on utensil; short time
Mild	Yellow	Carotinoid	Insoluble	Stable	Stable	Stable	Little or no water; cover on utensil; short time
Mild	Red	Lycepene	Insoluble	Stable	Stable	Stable	Little or no water; cover on utensil; short time
Mild	White	Flavones	Soluble	Brownish gray if cooked long	Colorless	Yellow	Cover on utensil; short time; avoid chipped enamel or iron utensil
Sulphur containing	White	Flavones	Soluble	Brownish gray if cooked long	Colorless	Yellow	Little water; no cover on utensil
Mild	Red	Anthocyanins	Soluble	Stable	Intensifies	Purple	Cook in skins; little water; cover on utensils; avoid metal utensils
Sulphur containing	Red	Anthocyanins	Soluble	Stable	Intensifies	Purple-blue-green if flavones are present	Water to cover, no cover on utensil; avoid metal utensil

16. VEGETABLE GROUPINGS. Before choosing a cooking method for vegetables it is best to group them according to their moisture content, intensity of flavor, and starch content. There are four types.

a. HIGH MOISTURE AND MILD FLAVOR. High-moisture, mild-flavored vegetables are usually fragile vegetables which require extreme care in preparation to produce a quality product. These vegetables furnish much of their own moisture for cooking. They include green beans, peas, carrots, celery, and spinach.

b. HIGH MOISTURE AND STRONG FLAVOR. Strong-flavored vegetables contain a sulfur substance. When sulfur compounds in vegetables combine with other compounds, undesirable color and flavor develop. For example, cabbage turns red during prolonged cooking. Maturity and overcooking develop a biting, mustard-tasting compound in cabbage, turnips, and onions. This taste in mature vegetables can be dissolved if the vegetables are cooked in plenty of water; it does not develop in fresh, young vegetables if they are not overcooked. Vegetables in this group include cabbage, cauliflower, onions, rutabagas, and turnips.

c. MOIST AND STARCHY. Moist, starchy vegetables contain 70 to 75 percent moisture and 20 to 25 percent starch. White potatoes and sweet potatoes are cooked by methods that allow for the starch content. Green peas, green lima beans, and kernel corn are included in this group because of their fairly high starch content, but they are prepared as high-moisture, mild-flavored vegetables.

d. DRY AND STARCHY. Dry, starchy vegetables include dry beans and dry peas.

17. METHODS OF COOKING. Vegetables are cooked with dry heat by baking, sautéing, and deep-fat frying; they are cooked with moist heat by steaming, boiling, and cooking in the oven. The method of cooking selected should produce the least loss of color, flavor, and nutrients. The cooking losses to which vegetables are subject are of two types, chemical and mechanical. Chemical losses may occur through the loss of minerals and vitamins dissolved by water, by decomposition caused by the reaction of the cooking water or by heat, by oxidation or air exposure, and by the evaporation of volatile substances. Mechanical losses occur by paring or slicing, by rapid boiling, and by overcooking. The cooking of fresh, frozen, canned, and dried vegetables are described in separate paragraphs. The methods of cooking for the various vegetable groupings are as follows:

a. HIGH MOISTURE AND MILD FLAVOR. High-moisture, mild-flavored vegetables are most often steamed. This method, which is valuable from the standpoint of preserving nutrients, may be used for most mild-flavored vegetables. Steaming retains the original shape of the vegetable. High-moisture, mild-flavored vegetables may also be boiled. Roots and tubers may or may not have skins removed, depending on the method to be used in cooking them. Raw carrots should be scraped (never pared). If possible, they should be cooked in their skins and plunged into cold water after they are boiled; the skins are then easily removed.

b. HIGH MOISTURE AND STRONG FLAVOR. High-moisture, strong-flavored vegetables are usually boiled in enough water to cover them in an uncovered cooking utensil. Leafy, green vegetables in this group contain a certain amount of volatile vegetable acids which escape when the vegetables are cooked uncovered. Cabbage is often sautéed or pan fried because its high water content enables it to be cooked in its own juice when a small amount of fat is added. Cauliflower is baked as au gratin or polonaise. It may also be french fried after it has been boiled until just tender. Onions and other high-moisture, strong-flavored vegetables served in casseroles and in other dishes are sautéed or boiled first.

c. MOIST AND STARCHY. Moist, starchy vegetables may be cooked with dry heat by baking them whole in an oven, or may be cooked with moist heat as a casserole such as a scalloped, an au gratin, or other combination dish. Baking is the best cooking method for preserving flavor and nutrients. Moist, starchy vegetables may also be cooked by boiling, the most common method of cooking vegetables. The method of cooking white potatoes that is by far the most acceptable to the troops is deep-fat frying.

d. DRY AND STARCHY. Dry, starchy vegetables are soaked in water co replace the water lost in the drying process and are then boiled until tender. They are served either plain or combined with other ingredients in various baked dishes.

18. PROGRESSIVE COOKERY. Progressive cookery should be used for most vegetables served in the dining facility. This method of cooking vegetables helps to insure that the color and flavor are preserved, that each person is served freshly cooked vegetables, and that leftovers are minimized. The food service sergeant indicates on the cooks' worksheet the amount in each batch and the time for cooking each batch. The following suggestions should help to improve the quality of vegetables served:

a. Cook vegetables in small batches so that the heat penetrates to the center of the mass quickly and evenly.

b. Cook vegetables until they are barely tender, because the heat in the mass will continue to cook the vegetables after they are removed from the stove.

c. Empty the pan that is in the steamtable before replacing it with a freshly cooked pan, because the heat from the steam changes the color of the vegetables in the table. in this way, all vegetables of one type in the serving line will be the same color.

d. If the item is moving slowly, cook even smaller batches, or eliminate the entire last batch.

19. BASIC NOTES ON VEGETABLE COOKERY. The cooking of fresh, frozen, and other types of vegetables is discussed later by types; however, the following cooking procedures pertain to all types.

a. Vegetables should be cooked the shortest time possible consistent with their type.

b. Strong-flavored and fresh, green vegetables should be boiled in water in an open kettle, because the green vegetables are greener and the flavor of the strong vegetables is milder.

c. Nongreen, mild-flavored vegetables are best cooked in a steam kettle.

d. Vegetables should be handled carefully to avoid mashing them.

e. The time of internal cooking should be controlled so the vegetables will be ready just at serving time.

f. Overcooking of green vegetables produces an unattractive color.

g. Freshly cooked vegetables should be delivered to the serving line at frequent intervals; holding green vegetables causes them to become dull, drab, and unappealing.

h. Vegetables should not be held in the steamtable longer than 20 minutes for optimum quality.

i. Because ascorbic acid and the B-vitamins are soluble in water, vegetables containing these vitamins should be cooked in as little water as possible. The cooking water, which absorbs these vitamins, should be retained for soup or stock.

j. The dark-green leaves of lettuce and cabbage are high in carotinoids as well as chlorophyll. Removing these leaves decreases the vitamin A of the vegetable.

k. Removing the stems and even the midribs of leaves (turnip greens or spinach) decreases the cooking time without decreasing nutritive value, because these parts have less ascorbic acid, carotinoids, and iron than the leaf blade has.

l. Cutting carrots crosswise causes greater loss of ascorbic acid than cutting them lengthwise into quarters.

m. The cooking of vegetables should be started in boiling water, and the water should be brought back to boiling as soon after the vegetables are added as possible. This procedure lessens the oxidation of ascorbic acid.

n. Almost all vitamin A is retained by vegetables cooked by most methods because the carotinoids are insoluble in water and are resistant to oxidation.

o. Vitamins A and C are destroyed more rapidly at high temperatures, and the greater the cooking time is, the greater the loss.

p. Chlorophyll (the green color of vegetable leaves and stems) is affected by acids, alkalies, and certain minerals in the presence of heat. If acids or minerals are present in the water in which green foods are cooked, the green gradually changes to an unattractive greenish brown.

q. Vegetables, except some dried legumes, should not be soaked in water.

r. Cooked vegetables should not be allowed to stand in hot water after they are done because they will continue to cook, will become extremely soft, and will lose their natural color.

s. The calcium content of vegetables is affected by the calcium content of the water in which they are cooked. Sometimes legumes develop an undesired firmness when soaked or cooked in hard water.

20. VEGETABLE STANDARDS. The standards for judging the quality of cooked vegetables are the same for all types, whether they are cooked by dry-heat or moist-heat methods. The quality of cooked vegetables is judged by their appearance, flavor, and texture. Broken vegetables, vegetables with uneven shapes and sizes, and those which have lost color or have false colors lack appeal. Fresh flavor and fresh appearance are the main qualities sought. Vegetables which are watery, dry, or stringy or those which have other objectionable texture detract from the quality of the meal. The appearance of the finished product on the serving line is as important to the acceptance of the vegetable as the flavor is, if not more so. Every effort should be made to maintain a steady flow of uniformly high-quality vegetables to the steamtable.

21. PREPARATION OF FRESH VEGETABLES. The fresh vegetables issued to dining facilities include such items as cabbage, carrots, eggplants, parsnips, celery, potatoes, squash, and turnips. (Dry onions are included in the guidelines for cooking fresh vegetables (fig. 12)). These items are either those that require little preparation before cooking or those that have not as yet successfully been frozen commercially. The major objectives for preparation of vegetables are to retain as much of the nutritive value as possible and to preserve the color, form, and quality. The achievement of these objectives requires careful scheduling of the work to minimize the time lapse between preparation and cooking. Root vegetables should not be prepared in advance and left to soak in cold water until cooking time. The loss of nitrogenous matter from soaked potatoes is as high as 58 percent, and the loss of minerals about 38 percent. To prevent or to reduce these losses, soaking of potatoes, carrots, and other root vegetables should be eliminated or be sharply limited. Fresh vegetables should be thoroughly washed before cooking. All blemishes should be removed and the vegetable cut or shaped. The preparation of cabbage is much more simple than that of other leafy vegetables. The outer leaves are removed, and then the head is washed and cut. When turnips are peeled with an electric peeler, they become soft and spongy; therefore, it is better to peel them by hand. Since rutabagas are waxed, they must be peeled by hand. After fresh vegetables are prepared for cooking, they are boiled, steamed, baked, deep-fat fried, or cooked otherwise as indicated on the daily menu.

a. BOILING. Boiling is a moist-heat method of cooking. Most vegetables are cooked by adding them to boiling water, bringing the water back to a boil, and then simmering them at 180° F. until they are done. Some vegetables, such as white potatoes, sweet potatoes, and carrots, may be boiled without first being peeled. When vegetables are boiled in their skins, the loss of nutrients is minimal. Peeling of white potatoes before boiling them increases the loss of ascorbic acid; however, peeling of carrots does not. The following suggestions should help to insure a palatable finished product:

(1) Do not allow vegetables to boil when cooking. Boiling has a tendency to break up and to overcook vegetables. Boiling tends to cause potatoes to cook apart, spinach or other greens to become slick, and vegetables like brussels sprouts to fall apart and to become misshapen.

(2) Do not stir air into the water while vegetables are cooking.

(3) When preparing fresh vegetables, cut them uniformly for proper and even cooking.

(4) Use a perforated container or a wire basket for immersing asparagus, broccoli, and brussels sprouts into boiling water to facilitate removing them after cooking and to prevent breaking them.

(5) Do not cover strong-flavored white, yellow, orange, or green vegetables during cooking.

(6) Cover mild-flavored white, yellow, or orange vegetables (potatoes, corn, squash, and carrots) during cooking.

(7) Cut high-moisture, strong-flavored vegetables (turnips and rutabagas) into small pieces to permit undesirable flavors to escape.

(8) Deliver cooked vegetables to the steamtable when they are slightly underdone or somewhat crisp, because they continue to cook while on the serving line.

b. STEAMING. Another moist-heat method of cooking vegetables is steaming. The finished product should have almost the same appearance and flavor as a vegetable cooked by boiling. Vegetables are steamed in a pressure cooker or in a steam jacket. In a pressure cooker which operates at 5 to 6 pounds of steam pressure, the temperature is 225° to 230° F. Vegetables can be cooked about 10 percent faster by pressure-cooking than by boiling. Some of the larger pressure cookers operate at 15 pounds of steam pressure, which produces a higher temperature and thereby reduces the cooking time. Steam-jacket cooking is different from steam pressure-cooking in that the food is not directly exposed to the steam. The steam flows around the bowl of the kettle, and provides an equal distribution of heat around the sides and bottom. The food is cooked at 212° F. In the same amount of water as that used in boiling; however, the boiling point is reached much faster because the kettle is uniformly surrounded by heat. The big advantage of cooking vegetables in a steam jacket is that they cook more quickly than when boiled and retain more minerals, vitamins; and flavor. Compartmented steamers accommodate either wire or deep, perforated baskets. Some pans for pressure cookers and steam jackets are solid; others have perforated bottoms for specific cooking uses. The perforated pans are used whenever possible for steaming vegetables. Different cooking periods are specified for some vegetables when these pans are used. The directions for steam cooking must be carefully followed; each type of cooker comes with specific operating instructions. The following factors enter into the actual timing of the steam-cooker operations:

(1) The maturity of the vegetable.

(2) The variety of the vegetable.

(3) The style and the size of cut vegetable pieces.

(4) The manner of placing vegetables in the steamer pan.

(5) Whether cooking container are solid or perforated.

(6) The size of the botch.

Note. Leafy, green vegetables (exempt spinach) and okra do not steam cook well; these vegetables should be boiled.

c. BAKING. Baking conserves the mineral content of vegetable better than boiling and is highly desirable for vegetables suited to this method. Baking vegetables whole in the skin is best; white potatoes, sweet potatoes, and squash are excellent when cooked in this manner. Some raw vegetables were peeled, sliced, and cooked with other ingredients for tasty baked dishes. The only mineral low is that which occurs when vegetables are peeled. Baked dishes are often served as glued, au gratin, or scalloped vegetables. Some vegetables served a glazed dishes are carrots, parsnipe, and sweet potatoes. Corn, white potatoes, sweet potatoes, apples, and tomatoes are served as scalloped dishes; and asparagus, cauliflower, cabbage, and white potatoes are served as au gratin dishes. Other baked dishes include lyonnaise carrots, corn pudding, baked corn and tomatoes, fried eggplant parmesan, baked onions with tomatoes, and candied sweet potatoes. Whole, baked white and sweet potatoes should be cooked through to the center without the skins becoming burned. When properly done, scalloped and au gratin dishes and corn pudding should be moist without being soupy; they must have been cooked slowly to avoid curdling. Each recipe gives the cooking temperature and other instruction for preparing a quality product. The following suggestions should help to insure an acceptable baked vegetable:

(1) For baking whole potatoes or squash, select those that are about the same size to insure that they all cook in about the same time.

(2) Brush whole potatoes with oil so the skins will be soft and tender. The skins of white potatoes, which contain many of the nutrients that are usually lost, may be eaten.

(3) Open the skin of a potato when it has finished baking to allow the steam to escape and to prevent sogginess (fig. 13).

(4) If squash becomes too brown while baking, cover the surface with foil.

(5) If cheese is added to the baked vegetable dish, do not let it overbrown.

(6) Baste glazed vegetables often while they are baking so each piece will have a glossy sheen.

(7) Cook roux for scalloped dishes at least 5 minutes to avoid a starchy taste.

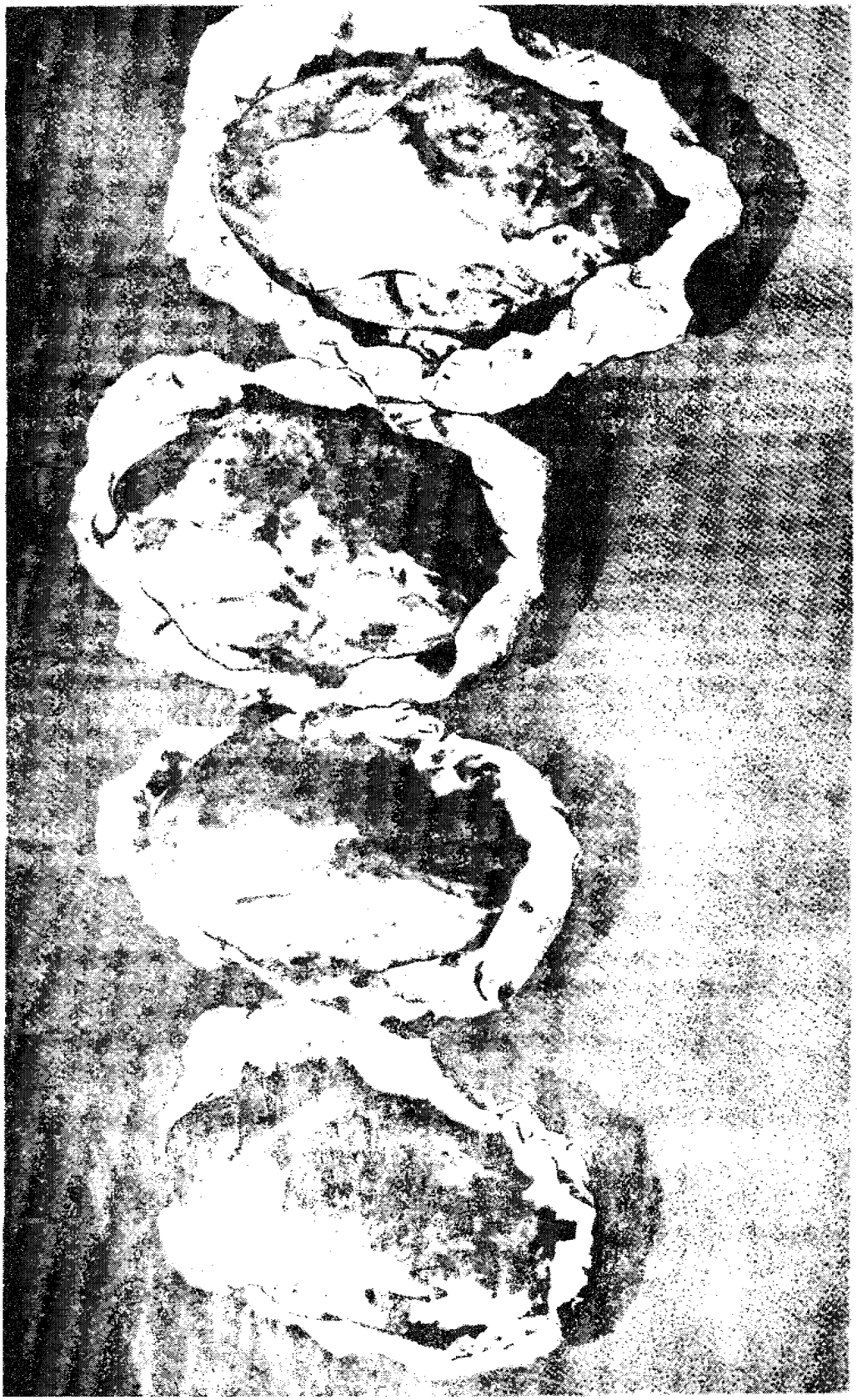


Figure 13. Baked potato after it has finished baking.

d. DEEP-FAT FRYING. Some vegetables such as white potatoes, onion rings (fig. 14), and eggplant are cooked by deep-fat frying in the raw stage. Yellow onions, such as bermuda and spanish onions, which have a mild, sweet flavor, are best for frying For deep-fat frying of vegetables, the following precautions must be taken to insure an acceptable finished product:

(1) Prepare the vegetable in advance of heating the fat.

(2) If the item is breaded, shake off any excess coating.

(3) Fill the basket about 1/3 full. If the basket is too full, the fat cools excessively, and the food absorbs too much fat.

(4) Insure that the surface of the vegetable is dry before putting it into the basket.

(5) Heat the fat to the temperature specified in the recipe. If the fat is not hot enough, the food will absorb too much fat.

(6) Do not overbrown the vegetable, or it will not have eye appeal.

(7) Drain vegetables after cooking them to remove excess fat.

e. GRILLING OR SAUTÉING. Home fried potatoes, southern-fried okra, and other vegetables are cooked on the grill or are pan fried. A small amount of fat is placed on a grill or in a frying pan and is heated; the vegetables are then added and are cooked until a light, golden coat or crisp outer surface is developed. Finely shredded vegetables with high water content are sautéed in a small amount of fat. The liquid from the vegetables add flavor and moisture to the finished product. Frequently, diced bacon is used (instead of oil, shortening, or butter) by first lightly sautéing the bacon and then adding the vegetables. Sautéed or pan-fried vegetables must be stirred frequently to avoid scorching. White potatoes and other vegetables are often boiled or steamed until almost done and then pan fried or grilled to produce a tasty acceptable variation.

22. FROZEN VEGETABLES. Freezing protects the nutritive values of food the most satisfactorily of all the methods of preservation. If frozen vegetables are cooked with a minimum of water, and if the remaining liquid is used in soups and sauces, there is no loss of minerals and very little loss of vitamins. Most vegetables are cooked while still frozen; if completely thawed before cooking, they shrink, lose flavor, and become tough. Spinach and other leafy vegetables, cauliflower, broccoli, brussel sprouts, and asparagus should always be partially thawed to insure uniform cooking. Corn on the cob must be completely thawed, before cooked, or the inside of the kernels will remain cold. Vegetables to be thawed, or partially thawed, should be placed in the refrigerator at 34°° to 39 F., if there is time and space. Frozen foods are more susceptible to spoilage than are fresh foods because their tissues are softened and broken in the freezing process Therefore, frozen vegetables must be cooked and served immediately after thawing or partially thawing. Frozen vegetables should not be refrozen. Figure 15 gives guidelines for cooking frozen vegetables. The main difference in the preparation of fresh and frozen items is that fresh items require paring, shaping, and washing. The cooking time is less,

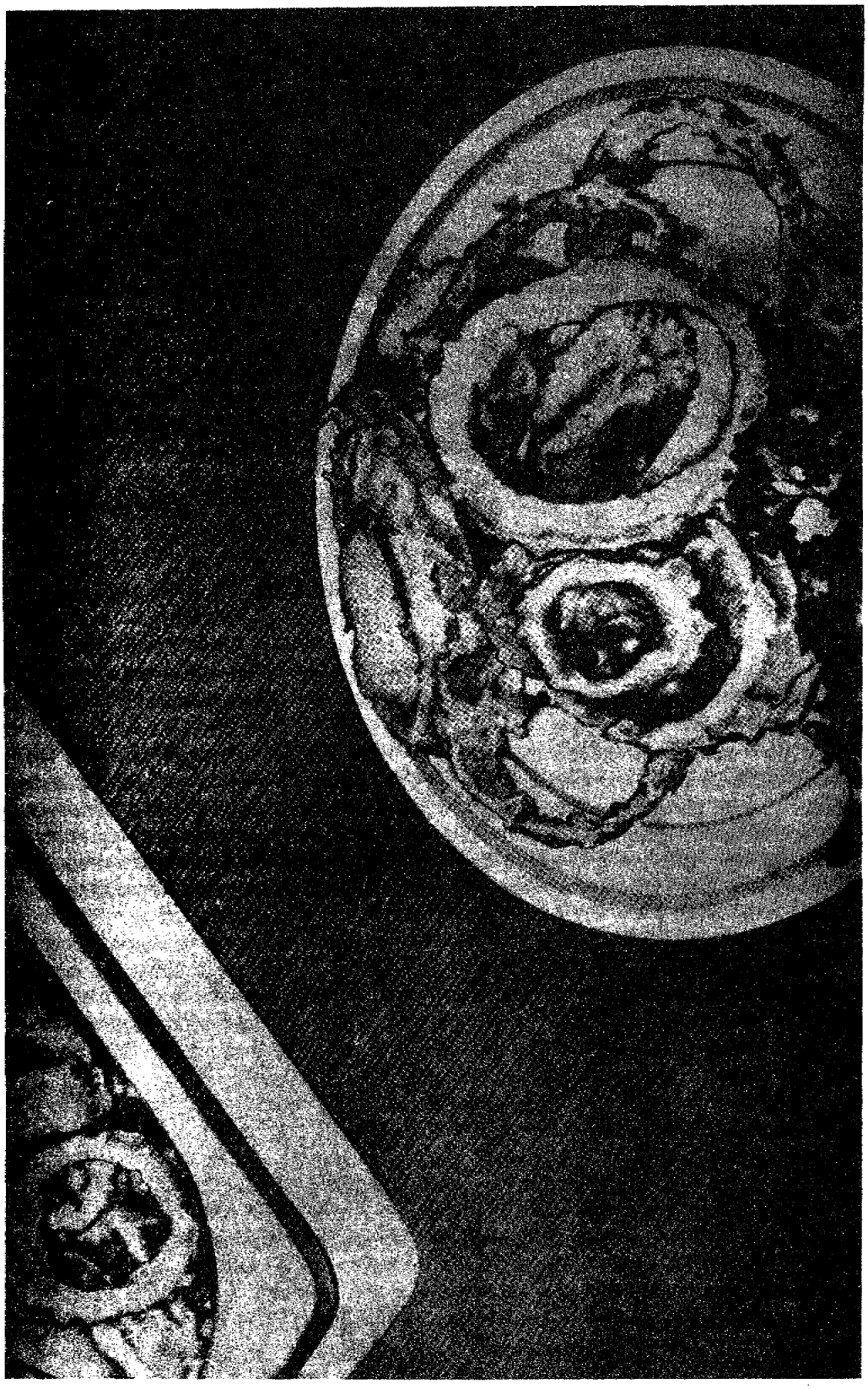


Figure 14. Deep-fat-fried onion rings.

GUIDELINES FOR COOKING FROZEN VEGETABLES

(buttered)

YIELD: 100 Portions				EACH PORTION: About ½ Cup
VEGETABLE	LB	APPROX AMT OF WATER	APPROX COOKING TIME	METHOD
Asparagus	18 lb	to cover	8 to 10 min	1. Place vegetables in steam-jacketed kettle or stock pot. 2. Add hot water to barely cover or as indicated. 3. Add 1 tsp salt for each quart of water. 4. Bring to a boil; cover. 5. Reduce heat; cook gently for the indicated time or until vegetable is just tender. 6. Drain; place vegetables in serving pan.
Beans, green or wax	16 lb	to cover	8 to 12 min	
Beans, lima	18 lb	to cover	12 to 18 min	
Broccoli	20 lb	to cover	7 to 9 min	
Brussels sprouts	20 lb	to cover	7 to 15 min	
Carrots, slices	20 lb	1 gal	10 to 15 min	
Cauliflower	20 lb	to cover	4 to 8 min	
Corn-on-cob, 100 ears	32–37 lb	to cover	5 to 10 min	
Corn, whole grain	18 lb	1 gal	4 to 8 min	
Greens, collards, mustard or turnip	18 lb	1 gal	15 to 35 min	
Okra	18 lb	1 gal	3 to 5 min	
Peas	18 lb	to cover	8 to 10 min	
Peas and carrots	18 lb	to cover	8 to 10 min	
Spinach	18 lb	½ gal	4 to 6 min	
Squash, summer	20 lb	2 cups	10 to 12 min	
Succotash	18 lb	1 gal	12 to 18 min	
Vegetables, mixed	18 lb	to cover	12 to 14 min	
Butter or margaine, melted	1 lb	2 cups		7. Combine melted butter or margarine and cooking liquid. Pour an equal amount over cooked vegetables. Garnish as desired.
Cooking liquid		2 cups		

NOTE: 1. Cooking time refers to time after water has returned to second boil.
2. Use progressive cooking for vegetables. Calculate cooking time; schedule preparation for quantity needed at 30 minute intervals; usually no more than a 50 portion batch should be cooked at a time.
3. Tap vegetable packages lightly to break up solid blocks. Partially thaw spinach and other leafy green vegetables.
4. To prevent breaking up, asparagus, broccoli, brussels sprouts and cauliflower should be placed in a wire basket for immersion in boiling water. Serve 2 to 3 broccoli stalks, 4 to 6 brussels sprouts (depending on size) or 3 to 4 cauliflower pieces per serving.
5. To cook in steamer, place vegetables in pans. See Guidelines for Steam Cookers A-21. Proceed with Step 7.

Figure 15. Guidelines for cooking frozen vegetables (buttered).

since all frozen vegetables are blanched (partly cooked by scalding water during processing) before they are frozen. When properly cooked, frozen vegetables retain their color and shape and have a fine flavor.

23. CANNED VEGETABLES. Commercially canned vegetables are of high quality because they are picked at the peak of their goodness and are prepared and processed within a few hours after harvesting. For canned vegetables to retain their utmost flavor and food value, the liquid in which they are packed should be used for heating them. Usually, only part of the liquid is required for heating, and the balance is saved for making soups or sauces. Canned vegetables need only to be reheated because they are already cooked to doneness. These vegetables are prepared for serving by the progressive cookery method; that is, small quantities are prepared at a time so that each serving is fresh in color and flavor. Figure 16 gives guidelines for heating canned vegetables. Heated canned vegetables should be garnished with an appropriate, contrasting, edible garnish, such as pimento, nuts, browned bread crumbs, sieved egg yolks, or parsley. Commercially canned vegetables, which have been prepared and inspected according to standards, are considered ready for use; however, some spoilage may occur. All cans should be inspected upon opening. The following rules should be observed:

a. Make sure that the top of the tin is flat or slightly concave.

b. Listen for a sound when the can is opened which properly indicates the vacuum in the can is being filled with air.

c. Discard any can which spurts liquid or air; such an outrush is an indication of spoilage.

d. Discard any food with an off odor.

24. DRIED VEGETABLES. Drying is one of the oldest methods of food preservation and is still the most widely used. Grains, legumes, nuts, and certain fruits mature on the plants and dry in the warm wind. Legumes are good sources of phosphorus, iron, thiamine, niacin, and protein. Dried legumes (kidney, lima, pinto, and white beans and black-eyed peas) are served in Army dining facilities. The water lost in ripening and drying the food items must be replaced by soaking the items in water and by cooking them. Legumes are rich in protein, and because protein toughens at boiling temperature, they should be simmered, rather than boiled, throughout the entire cooking period. Figure 17 gives the recipe for simmering dry beans. There are many variations for serving dried legumes, some of which are boston baked beans, italian-style baked beans, and spanish-style lima beans. To insure palatable finished products, the following suggestions should be of help:

a. If other vegetables are to be added before the beans are baked, sauté them until just tender--not browned.

b. Since molasses tends to toughen protein of beans, be sure the beans are cooked tender before the molasses is added, if the recipe calls for this seasoning.

c. Add hot water sparingly if required to keep the beans moist.

GUIDELINES FOR HEATING CANNED VEGETABLES

(Buttered)

YIELD: 100 Portions			EACH PORTION: ½ Cup
INGREDIENTS	WEIGHTS	MEASURES	METHOD
Asparagus, spears and stalks	31 lb 11 oz	35-No. 300 cn	1. Pour off half the liquid.
Beans, green or wax	25 lb 4 oz	4-No. 10 cn	2. Place vegetables and remaining liquid in steam-jacketed kettle or stock pot.
Beets	26 lb	4-No. 10 cn	3. Heat to serving temperature about 10 minutes; stir gently while heating. DO NOT ALLOW TO BOIL.
Carrots	26 lb 4 oz	4-No. 10 cn	4. Place in serving pans.
Corn, whole grain	26 lb 8 oz	4-No. 10 cn	
Okra	27 lb 2 oz	28-No. 303 cn	
Onions	25 lb 4 oz	4-No. 10 cn	
Peas	26 lb 4 oz	4-No. 10 cn	
Spinach	24 lb 8 oz	4-No. 10 cn	
Butter or margarine, melted	1 lb	2 cups	5. Pour an equal amount of butter or margarine over vegetables in each pan. Garnish as desired.

NOTE: 1. Prepare vegetables in small batches to prevent breaking up, discoloration and overcooking.
2. Leftover liquid may be used in making soups, sauces, and gravies.
3. To heat in steamer, place vegetables in pans. See Guidelines for Steam Cookers A-21. Proceed with Step 5.
4. For substitution of smaller size cans, see guideline card A-5.

(seasoned)

YIELD: 100 Portions			EACH PORTION: ½ Cup
INGREDIENTS	WEIGHTS	MEASURES	METHOD
Beans, lima	26 lb 4 oz	4-No. 10 cn	1. Place entire contents of cans in steam-jacketed kettle or stock pot.
Beans, white, in tomato sauce with pork	35 lb 8 oz	4-No. 10 cn	2. Add seasonings as desired; bring to a simmer and heat about 10 minutes; stir occasionally. DO NOT ALLOW TO BOIL.
Corn, cream style	26 lb 8 oz	4-No. 10 cn	
Peas, black-eye	26 lb 4 oz	28-No. 300 cn	
Peas, field	24 lb	24-No. 303 cn	
Sauerkraut	24 lb 12 oz	4-No. 10 cn	
Tomatoes	25 lb 8 oz	4-No. 10 cn	

NOTE: 1. In Step 2, vegetables may be seasoned with: 1 lb (2 cups) bacon fat, butter or margarine; 1 lb (3 cups) diced bacon, cooked until crisp; 1 to 2 tsp black pepper.
2. For additional seasonings, see guideline card Q-G-4.
3. To heat in steamer, place vegetables in pans. See Guidelines For Steam Cookers A-21.
4. For substitution of smaller size cans, see guideline card A-5.
5. In Step 2, black-eye peas may be seasoned with 1 lb (3 cups) diced raw bacon. Simmer bacon and peas 45 minutes.

Figure 16. Guidelines for heating canned vegetables.

SIMMERED DRY BEANS

(black-eye, kidney, lima, pinto, and white)

YIELD: 100 Portions				EACH PORTION: ½ Cup
INGREDIENTS	WEIGHTS	MEASURES		METHOD
Beans, black-eye, kidney, lima, pinto or white, dry	8 lb	5 qt (variable)		1. Pick over and wash beans thoroughly. 2. Cover with water; bring to a boil; boil 2 minutes. Turn off heat.
Water, cold		5 gal		3. Cover and let soak 1 hour.
Bacon, chopped	2 lb	1½ qt		4. Add bacon, salt, pepper, and water to beans.
Salt	2½ oz	3¾ tbsp		
Pepper, black		1 tbsp		5. Bring to boil; cover. Simmer 1½ hours or until beans are tender, but not mushy. Add boiling water if beans become dry.
Water		to cover		

NOTE: Alternate method: Omit Steps 2 and 3. Cover beans with cool water and soak overnight. Follow Steps 4 and 5.

Figure 17. Recipe for simmered dry beans.

d. If cheese is used as a topping for the baked beans, add it only after the baked dish is thoroughly cooked and ready to serve.

25. DEHYDRATED VEGETABLES. Dehydrated vegetables are fresh vegetables that have been dried by artificial means (usually heat). Dehydrated foods are more concentrated and therefore require less storage space and do not have to be refrigerated. Dehydrated vegetables issued to dining facilities include cabbage, onions, and potatoes. These foods are rehydrated or reconstituted; that is, the water removed during the dehydration process is replaced. Because of the varied nature of dehydrated vegetables, several ways of reconstitution may be used. For best results, the instructions provided by the manufacturer should be followed. Unless otherwise specified, most dehydrated vegetables are cooked by starting in cold water, bringing to a boil, reducing the heat, and then simmering until tender. Once they are cooked, dehydrated vegetables should be seasoned and served in the same manner as other cooked vegetables.

26. OTHER VEGETABLES. At present Army dining facilities receive two other types of vegetables: dehydrofrozen and dehydrated by freeze-dry process. Armed Forces Recipe Service. gives a recipe for dehydrofrozen peas. In the dehydrofreezing process, about 50 percent of the water is removed from the item, and the item is then frozen. Dehydrofrozen items must be kept frozen until they are prepared for cooking. Food items

dehydrated by the freeze-dry process are frozen and compressed so that the water passes from the frozen state to a steam without returning to a liquid state. Items preserved by this method do not require refrigeration and are not distinguishable from other dehydrated foods. The package indicates the method of reconstitution.

PROGRAMMED REVIEW

The questions in this programmed review give you a chance to see how well you have learned the material in Lesson 4. The questions are based on the key points covered in the section.

Read each item and indicate your choice by circling the appropriate letter. If you do not know, or are not sure, what the answer is, check the paragraph reference that is shown in parentheses right after the item; then go back and study or read once again all of the referenced material and write your answer.

After you have answered all of the items, check your answers with the Solution Sheet at the end of this lesson. If you did not give the right answer to an item, erase it and write the correct solution in the space instead. Then, as a final check, go back and restudy the lesson reference once more to make sure that your answer is the right one.

REQUIREMENT. Exercises 1 through 32 are multiple choice. Each exercise has only one single-best answer. Indicate your choice by circling the appropriate letter.

A1. One way to prepare a large number of salads for a meal is to assemble the ingredients and prepare them by (para la)

a. color and type.

b. assembly-line method.

c. individual type.

d. creating elaborate combinations.

A2. Usually salad ingredients are broken, cut, diced, or sliced into pieces large enough to be distinguishable. Two exceptions to this general rule are (para la(S))

a. cabbage for slaw and lettuce for tossed salad.

b. vegetables for fresh vegetable salads and cabbage for slaw.

c. fruit for fresh fruit salad and cabbage for slaw.

d. cabbage for slaw, and fruits and vegetables for jellied salads.

A3. A jellied fruit or vegetable salad should have clear-cut edges, and a (para lb)

a. variety of fruits or vegetables.

b. rigid form.

c. firm and delicate texture.

d. rubbery texture.

A4. What are the three general types of salad dressings? (para 2)

a. Boiled, french, and salad dressing.

b. Fruit, boiled, and cooked.

c. Russian, french, and thousand island.

d. Mayonnaise, french, and cooked dressing.

A5. What salad dressing is used as the base for thousand-island and russian dressing? (para 2)

a. Mayonnaise.

b. Cooked.

c. French.

d. Boiled.

A6. What dressings are usually served with jellied waldorf salad? (table 1)

a. Salad dressing and cooked dressing.

b. French and mayonnaise.

c. Salad dressing and thousand island.

d. Salad dressing and piquant.

A7. One way to reduce quality low of raw fruits and vegetables offered at a self-service salad bar is to (para 3)

a. refrigerate prepared items overnight.

b. select foods that are high in nutritive value.

c. replenish the salad materials often.

d. place plenty of ice in the pans.

A48. Which one of the following sandwiches may be put in a box lunch? (para 5a(4) & fig. 5)

a. Ham salad.

b. Sliced ham with butter.

c. Chopped egg.

d. Variety meat with mayonnaise.

A9. How is lettuce prepared for a box-lunch sandwich? (fig. 5)

a. It is placed in the sandwich.

b. It is chopped and mixed with the sandwich filling.

c. It is wrapped separately.

d. It is chopped fine and wrapped separately.

A10. Which of the following is a true statement concerning the quality of a sandwich? (fig. 5)

a. Grilled sandwiches should be golden brown without any burned areas.

b. The fillings should be generous and should extend to the edge of the bread.

c. Box-lunch sandwiches should have matched slices of breed.

d. All of the above.

A11. Sandwich-spread variations are made by adding catsup, minced celery, horseradish, or lemon juice to (fig. 6)

a. mayonnaise.

b. boiled dressing.

c. butter or margarine.

d. sour cream.

A12. A roux used to thicken gravies and sauces is a mixture of (fig. 9)

a. hot liquid and corn starch.

b. hot milk and flour.

c. fat and flour.

d. drippings and bread crumbs.

A13. Sauces are rich-flavored, thickened liquids served with other food dishes to (para 6)

a. add calories to the meal.

b. change the appearance of the dishes.

c. enhance the acceptability of the foods.

d. form a heavy coating and saturate the foods.

A14. Characteristics of a good sauce are (para 6b)

a. proper consistency, light sheen, and fine flavor.

b. thick consistency with no sheen.

c. fine flavor and thick consistency with no lumps.

d. fine flavor and no sheen.

A15. Which one of the following is not a precaution to be taken to insure a good gravy? (para 7b)

a. Be sure that additions to the gravy such as mushrooms or nuts complement the dish.

b. If stock is not available, use beef bouillon to make gravy for beef.

c. Season the drippings well before making the roux.

d. Use drippings when available to conserve nutritive value of the meat.

A16. What action is taken if fat floats on the top of cream gravy? (para 7g)

a. The gravy is set aside to be used in soup.

b. The fat is skimmed off.

c. Milk is added to hold the fat in emulsion.

d. Flour is added to absorb the fat.

A17. What is the main difference between a dressing and a stuffing? (para 8)

a. Dressing is baked separately, and stuffing is baked with the main dish.

b. Stuffing is baked as a side dish, and dressing is baked with the main dish.

c. Dressing is cooked more thoroughly than stuffing.

d. Dressing contains more seasoning than stuffing.

A18. To insure that dressing will be a good finished product, how should the celery and onions be prepared? (para 8b)

a. Steamed until they are well done.

b. Fried separately until they are golden brown.

c. Sautéed until slightly tender

d. Sautéed until well done.

A19. Stocks that are to be used for preparing soups should be (para 9)

a. heated to the boiling point and strained.

b. defatted and strained.

c. strained and garnished.

d. heated to the boiling point and garnished.

A20. Complete the following statement: A light soup is served before a heavy meal; a heavy soup (para 10)

a. is served as an appetizer.

b. is served as a snack.

c. is served before special dinners.

d. is served before a light meal.

A21. Light soups that do not contain cereals or vegetables are called (para 10a)

a. chowders.

b. creamed soups.

c. purées.

d. consommé or bouillon

A22. When reconstituted soup and gravy base is used to make soup or gravy, what precautions must be taken to insure an acceptable product? (para 12 & fig. 11)

a. Check the recipe to be sure the soup and gravy base can be used.

b. Use own judgment to determine if the soup and gravy base will make the dish off color.

c. Check the seasoning before adding salt.

d. Allow time for flavor to develop after reconstitution.

A23. To avoid an undesirable flavor in vegetable soup, what precaution should be taken? (para 13a(10))

a. Add cabbage, onions, and turnips as directed by the recipe to prevent overcooking them.

b. Boil the soup rapidly to cook the vegetables quickly.

c. Add tomatoes last, as they tend to make the soup too tart if cooked too long.

d. Cut vegetables into small pieces so they will break up or shred during cooking.

A24. High-moisture, mild-flavored vegetables furnish much of their own moisture for cooking and are usually (para 16a & 17a)

a. cooked uncovered to allow the steam to escape.

b. boiled in water that is discarded.

c. steamed to retain their nutrients.

d. cooked quickly to evaporate the water.

A25. What method of cooking is nutritionally best for moist, starchy foods? (para 17c)

a. Boiling in an open kettle.

b. Baking in the oven.

c. Breading and frying.

d. Steaming in a kettle.

A26. One of the important reasons for cooking vegetables by the progressive cookery method is that (para 18)

a. each men receives freshly cooked vegetables.

b. high-moisture vegetables retain their color.

c. vegetables are not mashed with handling.

d. strong-flavored vegetables tend to be milder.

A27. How do acids or minerals in water in which green foods are cooked affect the finished product? (para 19p)

a. The vegetables cook tender more quickly.

b. The vegetables tend to toughen.

c. The color and texture are preserved.

d. The color changes to an unattractive greenish brown.

A28, What are the three standards for judging the quality of cooked vegetables? (para 20)

a. Shape, color, and crispness.

b. Appearance, flavor, and texture.

c. Texture, nutritive value, and shape.

d. Color and mineral and nutrient content.

A29. To control the quality of asparagus, broccoli, and brussels sprouts, these vegetables are cooked in boiling water using (para 21a(4))

a. a pinch of additive to retain their color.

b. a perforated container or wire basket to retain their shape.

c. a large pot so they can be stirred frequently.

d. a small pot to allow the escape of undesirable flavors.

A30. When a baked white potato is taken from the oven, the skin should be slit to (para 21c (3))

a. provide a convenient place for a pat of butter.

b. permit the potato to cool quickly.

c. allow the steam to escape to prevent sogginess.

d. test it for doneness.

A31. To retain the flavor and food value of canned vegetables (buttered), the following steps should be taken (fig. 16)

a. put contents of can in kettle, bring to a boil, boil 10 minutes, and season.

b. pour off the liquid, place vegetables in kettle, heat slowly, season, and serve hot.

c. Pour off half liquid, place vegetables in kettle, heat to serving temperature, place in serving pans.

d. pour off liquid, place vegetables in kettle, add seasoning, heat, and serve hot.

A32. Dried legumes (kidney, lima, pinto, white beans and black-eyed peas) are high in protein; therefore, boiling causes the finished product to be (para 24)

a. too brown.

b. tough.

c. dry.

d. lacking in color.

REQUIREMENT. Exercises 33 through 35 are matching exercises. Column I lists basic food items, and column II lists varieties of sauces or gravies. Select the sauce or gravy in column II that is generally served with the food item in column I, and indicate your answer by writing the column II letter below the column I number. Sauces or gravies listed in column II may be used once, more than once, or not at all.

Column I	Column II
A33. Eggs, fish, vegetables. (table 2)	a. Salad dressing.
	b. Mock-hollandaise.
A34. Fruit and vegetable salads. (table 2)	c. Dessert.
A35. Meats and poultry. (table 2)	d. Brown gravy.

REQUIREMENT. Exercises 36 through 38 are matching exercises. Column I lists methods for cooking or preparing certain vegetables, and column II lists the vegetable types. Select the vegetable type in column II that matches the method of cooking or preparation in column I, and indicate each answer by writing the column II letter below the column I number. Each vegetable type in column II may be used once, more than once, or not at all.

Column I	Column II
A36. Vegetables in this group such as white potatoes may be baked whole in the oven. (para 16c & 17d)	a. Dry and starchy.
A37. Leafy green vegetables in this group are usually boiled in enough water to cover in an uncovered utensil. (para 16b & 17b)	b. Moist and starchy.
A38. Vegetables in this group are usually fragile and require extreme care in preparation to produce quality products. (para 16a & 17a)	c. High moisture and strong flavor.
	d. High moisture and mild flavor.

REQUIREMENT. Exercises 39 through 50 are true-false. Record each answer by writing a T or an F next to the exercise number.

A39. Vegetables such as celery and onions used in making sauces should be well browned first. (para 6a(2))

A40. When making gravy, the roast pan should be deglazed to recover the flavor of the meat. (para 7d)

A41. Dressing should bake thoroughly, because a cold center supports the growth of bacteria and the food spoils easily. (para 8d)

A42. Stocks are made by putting bones of beef, poultry, or fish in the stockpot in cold water, bringing the stock to a boil, then reducing the heat, and simmering it for 3 or 4 hours. (para 9)

A43. Chowders are heavy soups which usually contain bacon, onions, and potatoes. (para 10b(1))

A44. Vegetables for soups should be chopped into irregular shapes and sizes to add attractiveness to the finished product. (para 13a(5))

A45. The cooking of vegetables should be started in boiling water, and the water brought back to boiling as rapidly as possible to lessen oxidation of ascorbic acid. (para 19m)

A46. When fresh vegetables are steamed, they cook faster than when they are boiled; therefore, the finished product tends to be mushy. (para 21b)

A47. If the fat used for deep-fat frying of potatoes is not hot enough, the potatoes absorb too much fat. (para 21d(5))

A48. Frozen spinach, cauliflower, broccoli, and corn on the cob are cooked in boiling water without first thawing. (para 22)

A49. Canned vegetables are prepared for serving by the progressive cookery method to insure that each serving is colorful and flavorful. (para 23)

A50. After dehydrated vegetables are reconstituted and cooked, they are seasoned and served in the same manner as other cooked vegetables. (para 25)

HAVE YOU COMPLETED ALL EXERCISES? DO YOU UNDERSTAND EVERYTHING COVERED? IF SO, TURN TO THE END OF THIS LESSON AND CHECK YOUR ANSWERS AGAINST THE SOLUTIONS.

APPENDIX

REFERENCES

1. Technical Manuals (TM)

10-412	Armed Forces Recipe Service

2. Field Manuals (FM)

10-25	Preparation and Serving of Food in the Garrison Dining Facility

SOLUTION SHEET

PROGRAMMED REVIEW

A1.	b	A26.	a
A2.	d	A27.	d
A3.	c	A28.	b
A4.	d	A29.	b
A5.	a	A30.	c
A6.	a	A31.	d
A7.	c	A32.	b
A8.	b	A33.	b
A9.	c	A34.	a
A10.	d	A35.	d
A11.	c	A36.	b
A12.	c	A37.	c
A13.	c	A38.	d
A14.	a	A39.	F
A15.	c	A40.	T
A16.	b	A41.	T
A17.	a	A42.	F
A18.	c	A43.	T
A19.	b	A44.	F
A20.	d	A45.	T
A21.	d	A46.	F
A22.	c	A47.	T
A23.	a	A48.	F
A24.	c	A49.	T
A25.	b	A50.	T